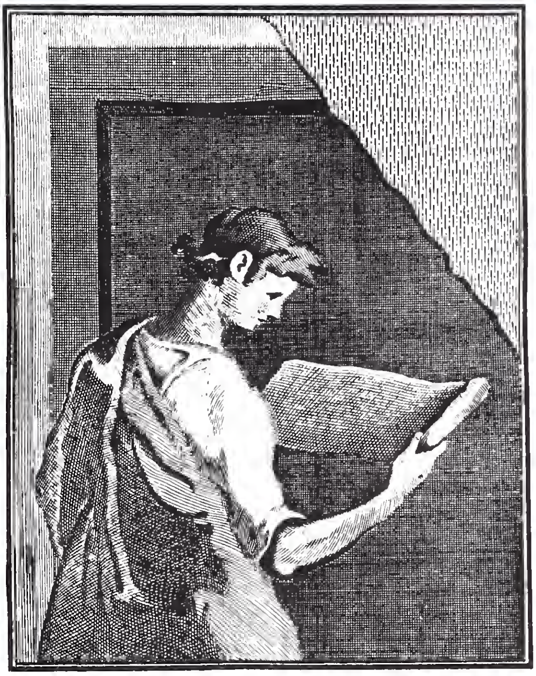

THE

LIVERPOOL AND MANCHESTER

PHOTOGRAPHIC JOURNAL.

VOL. I.—NEW SERIES.

1857.

LIVERPOOL:
HENRY GREENWOOD, 32, CASTLE STREET.
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ANNUAL REPORTS.

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

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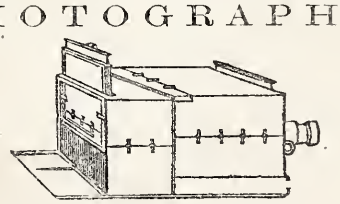

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 1.—JANUARY 1, 1857.

was our duty, in the last number, to announce change in the editorial management of this urnal; and it now devolves upon us to inform r readers of an alteration in the title. In our w career, the name of Manchester will be sociated with that of Liverpool on the title ge, arrangements being in progress for con- tuting this Journal the recognised organ of e *Manchester Photographic Society*. To be the icial organ of so large and flourishing a ciety as that of Manchester, would be a urce of gratification to any Journal; it is ore especially flattering to us, as the pro- sition came entirely unsought. We hope, in r next, to be able to state that the Man- ester Photographic Society, at their meeting the 7th inst., have officially ratified the above nouncement.

In another column we give the proceedings the Liverpool Photographic Society at the nual meeting held December 23rd, 1856. nong other important changes then agreed on was the alteration of the evening of meeting m the first to the third Tuesday in each nth; notices of which meetings will in future duly announced in this Journal.

The President and Council of the London otographic Society invited the members and ir friends to a Soirée on the 17th of last nth. By the kind permission of the council King's college, obtained we hear through the trumentality of Professor Delamotte, the ge hall of that building, together with the cious libraries and museum, were placed at service of the Society on this occasion. ery exertion had been made by the Secre- y (the Rev. J. R. Major), to provide for the usement as well as comfort of the visitors, l nobly did he uphold the credit which the iety has so well earned on former similar asions. Objects of interest were contributed the most generous manner, and the walls e covered with the finest specimens of the which have ever been collected together. Crystal Palace Company sent a large ggon loaded with the choicest gems from ir photographic gallery at Sydenham, amongst ch we noticed the monster photographs of dus, (from glass negatives, and covering a sized sheet of paper,) and that wonderful and cloud view of Le Gray, which has con- ed more fame upon him than even his own utiful wax-paper process. Foremost among productions of our own countrymen, were amotte's views of Oxford, nearly forty in nber, and the latest results of the Photo- vanographic Company, Lake Price's "Don xote in his study." The Astronomical Society lent the celebrated photographs of the moon taken by Professor Bond, in America. These, however, had one great fault—being taken on the daguerreotype plate, and afterwards magnified on collodion, the sides were trans- posed, and consequently their otherwise striking likeness was lost. By their side, exhibited by Mr. Crookes, was a powerful rival, six inches in diameter, which had been magnified from a small negative taken with Mr. Hartnup's assistance, by means of the noble equatoreal at Liverpool. The Rev. J. B. Reade exhibited a photographic copy of a drawing of the re- markable lunar crater, Copernicus, made by the Abbé Secchi at the Roman Observatory, and the result of the incessant labour of years. A photographic copy of the sublime "Last Supper" of Leonardo da Vinci, may be taken as the representative of very many interesting specimens of this priceless application of photo- graphy which adorned the walls. In portraiture, Hennah, of Brighton, stood as usual unrivalled, whilst the same may be said of T. R. Williams' stereoscopic slides, both paper and daguerreo- type. Messrs. Murray and Heath, of Picca- dilly, had a large assortment of stereoscopes, and some beautiful views of Mont Blanc, which seemed to attract universal admiration. There was one new construction of the stereo- scope, which from its originality deserves more than a passing notice; it was exhibited by Mr. Francis, Great Russell-street, Bloomsbury. In outward appearance it was a pillar, standing four or five feet high, having one of Wheat- stone's stereoscopes at the upper part, and a lamp shining into the apparatus through a ground glass, on the opposite side to the eye tubes. Thirty or forty stereoscopic slides were fastened together on an endless band, similar to the cards in a Jacquard loom, and on turning a nut at the side, they were in succession, brought into the field of view. The only exhibitors of chemicals employed in the practice of photo- graphy, that we noticed, were Messrs. Horne and Thornthwaite, of Newgate-street, who dis- played some large and splendid specimens of glacial acetic acid, perfectly solid, even in the comparatively warm room: fine crystals of chloride of gold, upwards of two inches in length, and a magnificent specimen of nitrate of silver, weighing about 400 ounces; this, we understand, was crystallized from about eight gallons of saturated solution; the total quantity of nitrate of silver present being nearly 1500 ounces, and the value of the metallic silver alone about £250. This firm also exhibited a very convenient and portable stereoscopic camera, suitable for taking ordinary sized stereo-

scopic views; the total bulk, including six slides for holding ready prepared plates, being about 10 inches long, by 8 deep and 6 wide. Another camera, of much interest to the photographer, from its extreme portability and convenience, was also exhibited by Messrs. Horne and Thornthwaite, the manufacturers to the inventor, Captain Fowkes; and although suitable for taking views 12 inches by 10, occupies together with its dark frame and focussing glass, only a space 13 inches long, by 11 wide and 3 deep. At one table were some powerful compound microscopes which shewed to what minuteness it was possible to get collodion pictures. Little spots on the slides, no larger than the head of an ordinary sized pin, were seen, by these instruments, to consist of groups of figures, landscapes, and portraits, as easily recognizable under the high magnifying power as if they had been full sized pictures. We regret that we could not learn the name of the ingenious photographer who took them. Among the company Dr. Livingstone, the great African traveller, was decidedly the lion of the evening; we recognized also most persons of eminence either in science or art, whilst the full evening dress of the ladies gave the assembly more the appearance of a fashionable ball room than a scientific conversazione. The libraries were converted into refreshment rooms for the occasion, and the fare provided up-stairs did equal credit to the Rev. Secretary's taste, with the mental repast below. Altogether we think that the society have good cause to congratulate themselves on the almost perfect gratification which their hospitality afforded to every one present.

We are sorry to state that complaints have reached us from high quarters that the extracts, which appeared in the November number of this Journal, of the remarkable correspondence between Sir D. Brewster and Professor Wheatstone respecting the stereoscope, together with the leading article in the same Journal, are not sufficiently full or clear to permit of our readers coming to a true knowledge of the points at issue. We therefore feel it our duty, in justice to both parties, to insert *verbatim* the entire correspondence as it appeared in *The Times*. Four of the letters are given in this number, and the remaining two will appear in our next.

Methods of preserving the sensitiveness of collodion plates are now attracting considerable attention both at home and abroad; we therefore give two of the most recent processes which have come to our knowledge, and shall feel thankful if any of our readers will favour us with the results of their experiments thereupon, as a really good *dry* process, as rapid and easy of manipulation as moist collodion, would be one of the greatest boons to all true lovers of the art.

Mr. Ackland, who was the first to reduce Taupenot's complicated collodio-albumen process into something like a workable form, and whose name will be familiar to all our readers as being one of the most trustworthy experimentalists in this branch of photography, has lately succeeded in reducing it to still greater simplicity; we trust soon to be able to lay before our readers a full description of the process as modified by him.

LIVERPOOL PHOTOGRAPHIC SOCIETY

The annual meeting of this Society was held a[t] the Royal Institution, Colquitt Street, on Tues[-] day evening, December 23rd, 1856.

Mr. Corey having been unanimously calle[d] to the chair,

Mr. J. A. Forrest observed that the questio[n] of joining the Historic Society was not yet in [a] position to be laid before the members. Th[e] Council of the Historic Society appointed a da[y] for meeting a deputation of the Council of th[e] Photographic Society, but as he (Mr. Forrest) onl[y] received intimation of the meeting on the morn[-] ing of the day on which it was to be held, h[e] was unable to go, in consequence of a previou[s] appointment. Dr. Hume, the Honorary Secre[-] tary of the Historic Society, had since gone t[o] the Isle of Man, where he would remain eigh[t] or nine days, and he did not know whether h[e] had yet returned. He (Mr. Forrest) was conse[-] quently not in possession of any new matter.

Mr. Bell, the treasurer, was decidedly oppose[d] to the Photographic Society joining any other. He thought it was quite strong enough itsel[f] and he did not see what object was to be gaine[d] by uniting with another society.

Mr. Forrest agreed with Mr. Bell that the[y] ought not to lose their identity as the Phot[o-] graphic Society; but he thought it was on[ly] courteous to entertain a suggestion coming fro[m] a quarter of such respectability.

The Chairman then proceeded to read t[he] annual report, which was as follows:—

REPORT FOR 1856.

"As it has already been explained to the me[m-] bers of the Society, the council are impelled [to] the present measure of bringing the yea[r's] business to a close from several causes. T[he] most prominent is the determination express[ed] by Mr. Bell, at the September meeting, that [he] would not continue in office as treasurer af[ter] December. This will of course involve t[he] necessity of deliberating whether a responsi[ble] person shall be selected and solicited to und[er-] take the office, and the Society continue as [at] present constituted, subject to important mo[di-] fications; or whether it shall be determined [to] accept the right hand of fellowship offered [by] a kindred society, and amalgamate the t[wo] societies into one; stipulating at the same ti[me] that the individuality of this Society shall [be] preserved as much as is compatible with [the] incorporation of the two. The council the[re-] fore have resolved on taking the present tim[e to] present the balance sheet, and to bring the [year] of office of the executives to a close, leaving [the] members in general to decide on their fu[ture] course of action.

"Examination of the balance sheet has sh[own] that from causes heretofore explained, a co[nsi-] derable deficit has always presented itself, [and] the trustees have, by a very large pecun[iary] sacrifice, met the most pressing of the dema[nds,] trusting that their active exertions would in[duce] a farther increase of members, whose subsc[rip-] tions would liquidate the remainder. Fin[ding] all prospect of assistance from their bro[ther] members to be hopeless, the proprietors of [the] *Liverpool Photographic Journal* resolved up[on a] farther sacrifice, and disposed of that Journ[al]

ated at the last meeting, which has sufficed r all remaining claims upon the Society.

"The council, however, now find that the bscription of half-a-guinea is inadequate, in e gross amount, for meeting the expenses the Society, and have resolved to recommend e increase of the subscription to one guinea r year for resident members, should the gene-l body of the members determine upon not ining the Historic Society. In that case, Mr. rrest, to whose untiring zeal and spirited rtizanship the Society owes its very existence, s most handsomely come forward and ex-essed his readiness to take the office of trea-rer. Mr. Berry, to whose labours and extent knowledge the Society is infinitely indebted, ill undertake the troublesome task of corres-nding secretary. In compliment to Mr. Bell r his disinterested labours as treasurer for the st three years, it is deemed advisable to elect m one of the vice-presidents.

"The council therefore present the list of ficers for the ensuing year as follows:—

Patron.
The Earl of Ellesmere.

President.
Viscount Brackley.

Vice-Presidents.

ames Newlands, Esq.	Christopher Bell, Esq.
. Rathbone, Esq.	*C. Corey, Esq.

*This name was added according to subsequent resolution.

Treasurer.—James A. Forrest, Esq.

Hon. Secretary.—William Keith, Esq.

Corresponding Secretary.—G. R. Berry, Esq.

Council.

McInnes, Esq.	J. Leithead, Esq.
Higgin, Esq.	J. Stephens, Esq.
T. Foard, Esq.	C. H. Chadburn, Esq.
Mercer, Esq.	W. N. Duckworth, Esq.

C. R. Jones, Esq.

Associate.—Frank Howard, Esq.

Honorary Members.

. L'Abbé Moigno, Paris.	J. Robinson, Esq., Dublin.
. Dubosq, Paris.	H. H. Hele, Esq., Plymouth.
v. St. Vincent Beechey.	J. W. Cox, Esq., Devonport.
llon Horne, Esq.	Wm. Ross, Esq., New York.
Thornthwaite, Esq.	T. Whitehead, Esq., Liverpool.
ederick Townsend, Esq.	
ontagu Marriott, Esq.	
fred Rosling, Esq.	
Bowes, Esq., Norwich.	

Capt. Barr, President, Bombay Society.
Dr. Buist, LL.D., Vice-President, ditto.
W. H. Stanley Crawfurd, Esq., } Hon. Secs., do.
W. Johnson, Esq. }
Four members of ditto, (names not furnished.)

"It is expedient to come to some arrange-nt with the authorities of the Royal Institu-n before the commencement of another year, they require the rent to be paid in advance. is resolved that the subscription shall be con-ered due on the 1st of January, and the trea-rer will require the same to be paid within one ek of that date. All future members to pay eir subscription at the time of election, else at election to be void, their names not to pear on the list, nor their attendance at the etings permitted.

"The present meeting cannot separate with-t offering their acknowledgments to Mr. Bell, his retirement from the office of treasurer.

"Resolved, on the motion of Mr. Harding, seconded by Dr. Ayrton, that in consideration of the increased subscription to be paid by the resident members, the treasurer be empowered to send a copy of each number of the *Liverpool Photographic Journal* gratis, to every such member, and that the notice of every subsequent and ensuing meeting be inserted therein in lieu of notices sent. Carried unanimously."

The statement of accounts was then submitted by Mr. Bell.

Mr. Berry thought it was their duty to elect Mr. Corey as another vice-president. He had taken great interest in the Society, not only by presiding night after night, but by bringing forward many new processes, after having himself thoroughly tested them. Mr. Corey was one of their most worthy and deserving members, and more than deserved this compliment at their hands.

Mr. Forrest seconded the proposition, endorsing every word spoken by Mr. Berry.

The proposition was adopted by acclamation, the report was passed, and the list of council, &c., was carried.

Mr. Berry gave a history of the *Liverpool Photographic Journal*, shewing that the idea of establishing it was originated by him; that it was carried out by one or two gentlemen, who, after working it up to a paying position, placed it at the service of the Society, the members of which, however, declined to take the responsibility. It consequently remained the property of the original proprietors, until it passed into the hands of Mr. Greenwood, the printer and publisher, in liquidation of the liabilities of the Society.

The Chairman, having made some observations, shewing the advisability of increasing the amount of the subscription, it was suggested by Mr. Forrest, the new treasurer, to raise the subscription of resident members to a guinea instead of ten shillings and sixpence; each member, resident and non-resident, to be presented with a copy of the *Liverpool Photographic Journal*. He was persuaded that if the Society were conducted with liberality and energy, they would be able to double the number of members in six months.

On the proposition of Mr. Harding, seconded by Dr. Ayrton, a resolution to this effect was unanimously adopted. The subscriptions of non-residents to remain the same—ten shillings and sixpence.

On the suggestion of Mr. Forrest, it was resolved that the practice of sending out notices, summoning members to the monthly meetings, be discontinued; announcements of the night of meeting, and the subject for discussion being given in the previous number of the *Liverpool Photographic Journal.*

On the suggestion of Mr. Corey, Mr. Berry was requested to write to Viscount Brackley, offering condolence for the extreme illness of the Earl of Ellesmere, and expressing a hope that when his own health would permit he would preside at some future meeting of the Society.

Mr. T. Whitehead, of the *Liverpool Albion*, on the suggestion of the Chairman, was unanimously elected an honorary member of the Society

It having been decided to hold the future ordinary meetings on the *third* Tuesday of every

month, in order to facilitate the insertion of a report of their meetings in the *Liverpool Photographic Journal*, the proceedings terminated.

Liverpool Photographic Society. — The next meeting of this Society will be held on Tuesday evening, January 6th, 1857, when a discussion will take place on the Dry Collodion Processes, with illustrations. — Wm. Keith, *Secretary.*

MANCHESTER PHOTOGRAPHIC SOCIETY.

The second meeting of the present session was held on Wednesday evening, Dec. 3, at the rooms of the Literary and Philosophical Society, George-street, which are much better adapted for the purpose than the Lecture Room of the Royal Institution.

Professor Williamson occupied the chair, and there was a numerous attendance of members.

Mr. Cottam, the secretary, reported that the council had decided upon two of the pictures for the forthcoming number of "Photographic Illustrations,"—one to be a portrait of Mr. William Fairbairn, C.E. F.R.S., a vice-president of the Society; and the other a copy of an oil painting by F. Wyburd, "The Kiosk—Lalla Rookh."

Mr. Cottam explained an ingenious diaphragm oi stop, by Mr. Noton, a new application to the camera, which is capable of being enlarged or diminished, by simply moving a lever, and may be changed without danger during the progress of a picture.

Mr. Sidebotham exhibited a contrivance for taking instantaneous pictures, consisting of a revolving disc, with a spring.

A new stereoscopic camera, by Mr. Dancer, was exhibited and explained by Mr. Sidebotham. This camera has several nice contrivances to lessen the trouble and simplify the operations of photographers in the field. The lenses are situated in the interior of the camera, out of harm's way. The focussing apparatus is a novel one, and the stops are attached to the instrument, thus avoiding the inconvenience often experienced of these appendages being missed when required. But its principal advantage is the position of the dark box, which is attached to the bottom of the camera. It has a moveable lid, fitted with rackwork, which allows a number of prepared plates, previously arranged in the box, to be drawn up successively into the dark slide, and to be returned after exposure. The inconvenience attendent on seeking and arranging in a dark chamber is thus entirely obviated. With this instrument Mr. Sidebotham said he had taken many pictures, having prepared his plates by the collodio-albumen process before leaving home, and developing them on his return. He believed a month might intervene between the two operations; and he exhibited some very beautiful specimens of his own production.

The Secretary read a paper on the albumen process, by Mr. Cash, a non-member, who had kindly prepared it at the request of the Society.

Some specimens of the Photo-galvano-graphic Company's production were handed round, and were much admired.

A waxed paper negative, on Hollingworth's thin paper, entirely free from the faults to which this process is liable; and some interesting microscopic photographs, by Mr. Parry, were also examined.

Two papers were announced, that for January being by the Rev. W. J. Read, entitled "*Visits to the Society's Photographic Collection*," now exhibiting at the Mechanics' Institution, David-street; and one on "*The Collodion Process*," by Mr. McLachlan, for February.

The next meeting will be on Wednesday, the 7th of January.

THE ORIGINAL INVENTION OF THE STEREOSCOPE.

The following is a reprint of the letters addressed by Professor Wheatstone and Sir David Brewster to the Editor of *The Times*, respecting the original invention of the stereoscope:—

No. I.

To the Editor of "The Times."

Sir,—M. Faye, a distinguished astronomer, and member of the Academy of Sciences in Paris, communicated to that body, on the 6th of October, an account of a new and simple stereoscope, of which the Abbé Moigno has given the following description in his *Cosmos* of the 12th of October:—

"M. Faye presented a new stereoscope, of his invention, of extreme simplicity. It is indeed a simple piece of cardboard or paper, in which are pierced two holes, whose centres are on the same horizontal line, and at the distance which separates the two eyes of the person who uses it. In looking through these two holes, about 12 millimetres wide (less than half an inch), at a stereoscopic slide, we see but one image, and for that reason we see it as much in relief as in the reflecting or refracting stereoscope. This is certainly a happy idea. * * * * The paper or the cardboard of M. Faye has the effect of making the optic axes rigorously parallel, as if they were directed to a point situated at an infinite distance. It is for this reason, and not, as Mr. Grove maintains, by crossing the optic axes by a forced and voluntary squinting, that the two images are superimposed."

In reference to this last remark, involving the theory of M. Faye's stereoscope, I may observe in passing, that if Mr. Grove means that the optic axes are crossed, or converged to a point in order to superimpose the images, he is unquestionably right, for the axes must be crossed at a point beyond the binocular slide. If he means that the axes are crossed at a point between the slide and the observer, he is wrong.

My object, however, is not to discuss the theory of the instrument, but to state the fact that it is not new, and has been long known and used in England. It is the invention of Mr. James Elliott, teacher of mathematics in Edinburgh, who contrived it in 1834, but did not execute it till 1839. Mr. Wheatstone had previously published the same principle in 183[illegible] (*Phil. Trans.*, 1838, p. 373.), but he used two separate tubes in place of the two holes employed by Mr. Elliott and M. Faye, and he directed the tubes to a point of convergence beyond the binocular pictures. It is well known that M. Claudet and others have the facility of converging their optical axes beyond the binocular pictures, and thus doing exactly what is done by Mr. Wheatstone's tubes, and Mr. Elliott's and M. Faye's holes; so that we ca[n]

only consider these tubes and holes as auxiliaries to our natural vision.

In M. Faye's stereoscope the effect produced does not depend upon the holes: it is produced by the opaque card between them simply eclipsing one of the pictures from each eye—the left hand picture from the right eye, and the right hand picture from the left eye. Here we have a still simpler stereoscope. Hold up between the eyes and the pictures two or three fingers, and looking past the left side of them with the left eye, and past the right side of them with the right eye, so that each eye sees only one picture, you will see the two superimposed, and the relief perfect. A piece of card of less width will answer better than the fingers, but the fingers are always at hand.

A short-sighted person, or a person wearing very deep convex glasses, may, upon bringing the pictures close to his face, unite them into stereoscopic relief without the aid of holes, tubes, or fingers.

I am, Sir, yours, &c.,

October 15*th*, 1856. A.

No. II.

To the Editor of "The Times."

Sir,—Allow me to make a few remarks on a letter which appeared in your columns yesterday, relating to the invention of the stereoscope.

In my memoir "on some remarkable and hitherto unobserved phenomena of binocular vision," which was presented to the Royal Society in June, 1838, and published in the Philosophical Transactions of that year, I described, besides the more perfect instrument to which I gave the name of "stereoscope," the only two methods by which binocular drawings might be seen in stereoscopic relief, without employing any optical appliances. In one, the pictures were placed beyond the intersection of the optic axis, in the other they were placed before it. The latter is the method subsequently adopted by Mr. Elliott and M. Faye.

I should not, however, have thought it of sufficient importance to trouble you with this explanation alone, but your correspondent "A," by exclusively adopting the dates and statements put forward in various publications by Sir D. Brewster, with the intention of proving that Mr. Elliott had conceived the idea of a stereoscope before I had, has given the extensive circulation of *The Times* to these imperfect allegations, and I wish to shew by sufficient facts that the claim thus supported is untenable.

The first public announcement of the principles of this invention appeared in the third edition of Professor Herbert Mayo's *Outlines of Human Physiology*, published in 1833. In giving a short notice of my then unpublished experiments, the author says (p. 288):—

"One of the most remarkable results of Mr. Wheatstone's investigations respecting binocular vision is the following:—A solid object being placed so as to be regarded by both eyes, projects a different perspective figure on each retina; now, if these two perspectives be actually copied on paper, and presented one to each eye so as to fall on corresponding parts, the original solid figure will be apparently re-produced in such a manner that no effort of the imagination can make it appear as a representation on a plane surface. This and numerous other experiments explain the cause of the inadequacy of painting to represent the relief of objects, and indicate a means of representing external nature with more truth and fidelity than have yet been obtained. It would require too much space to enter upon the physiological views to which these experiments have led their author."

Shortly after the publication of my completed memoir, I gave a brief account of it at the meeting of the British Association, which was held at Newcastle, in September, 1838. The great interest excited when the stereoscope was on that occasion brought forward, may be seen by referring to the contemporaneous accounts of the proceedings of that body in the *Athenæum* and *Literary Gazette*.

Sir D. Brewster and your correspondent, in accordance with him, represent Mr. Elliott as having conceived the idea of a stereoscope in 1834, and as having realized his conception in 1839. Admitting these dates, the first is the year after my experiments had been announced in a work of standard authority, and the latter date is the year after my instrument had been completely described, and had become extensively known. It moreover appears that Mr. Elliott made no public announcement of what he is stated to have done until 18 years after the public were informed of my results.

These are surely insufficient grounds to dispute the originality of an invention, and Sir David is the last person who ought to have advanced them, since I can shew, from our correspondence, that he was aware, so early as 1832, that at that time I was preparing for publication my memoir on the subject.

I am, sir, your obedient servant,

Athenæum, Oct. 18, 1856. C. WHEATSTONE.

No. III.

To the Editor of "The Times."

Sir,—In the notice of Mr. Faye's stereoscope which I sent you under the signature "A," not thinking it of sufficient importance to add my name, I claimed the invention of it for Mr. Wheatstone as well as for Mr. Elliott, referring distinctly to Mr. Wheatstone's paper, as published in 1838, and to the later date of 1839, when Mr. Elliott executed his instrument. I therefore gave to Mr. Wheatstone all the originality, which he claims from prior publication. But, as I had undoubted evidence that Mr. Elliott invented the stereoscope in 1834, and as his form of the instrument was exactly the same as Mr. Faye's, while Mr. Wheatstone's, though equally ingenious, was different, I placed Mr. Elliott's claim before Mr. Wheatstone's. I believe, therefore, that Mr. Elliott and Mr. Wheatstone are independent inventors of an instrument, or method, for uniting two dissimilar pictures, and thus producing relief, but that neither of them discovered the principle of the stereoscope. Mr. Elliott lays no claim to such a discovery. Mr. Wheatstone does, on the following grounds. After quoting a curious experiment on binocular vision, in which Leonardo da Vinci was on the eve of inventing the stereoscope, he makes the following observations:—

"Had Leonardo da Vinci taken, instead of a sphere, a less simple figure for the purpose of his illustration, he would not only have observed that

the object obscured from each eye a different part of the more distant field of view, but the fact would also, perhaps, have forced itself upon his attention that the object itself presented a different appearance to each eye. He failed to do this, and no subsequent writer within my knowledge has supplied the omission; the projection of two obviously dissimilar pictures on the two *retinæ* when a single object is viewed, while the optic axes converge, must, therefore, be regarded as a new fact in the theory of vision."—*Philosophical Transactions*, 1838, pp. 372-3.

Now, this claim to the fundamental principle of the stereoscope is groundless—Euclid knew it; Galen knew it, and explained it. Baptista Porta quoted Galen's explanation, and illustrates it with a figure. Aguilonius, in various parts of his *Optics*, does the same; and, in his chapter on the vision of solids (*τα στερεα, ta sterea*), he is puzzled in explaining how the two dissimilar pictures give a distinct image in relief. Early in 1852, and more recently, in my *Treatise on the Stereoscope*, I have quoted the passage from these authors to prove their knowledge of the principle in question, and Mr. Wheatstone has made no reply to the statement. It is, doubtless, strange that he was not acquainted with the researches of Galen, Porta, and Aguilonius, for he tells us (*Phil. Trans.* 1838, page 372) that, "after looking over the works of many authors who might be expected to have made some remarks relating to this subject, he was able to find but one, which is in the *Trattato della Pittura*, of Leonardo da Vinci." Among these works were those of Porta and Aguilonius, for he has, more than once, quoted both of them (pages 388, 390, 391, 393); but, though I make this remark, I do not mean to insinuate, nor do I believe, that Mr. Wheatstone saw the passages to which I have referred.

In the extract from Mayo's *Outlines*, &c., from which it is evident that Mr. Wheatstone was acquainted with the principle of the stereoscope in 1833, and therefore earlier than Mr. Elliott, there is no mention whatever of any instrument or method of combining the pictures. It affords no proof that the reflecting stereoscope was then in existence; that he did combine them is obvious, and, if he had assured us that he did it by means of the reflecting instrument, I should have placed implicit confidence in the statement.

In concluding his letter, Mr. Wheatstone remarks that I was the last person to have disputed the originality of his invention, as he can shew, from his correspondence with me in 1832, "that I was aware that at that time he was preparing for publication his memoir on the subject."

I therefore call upon Mr. Wheatstone to publish this letter, or any part of it that has the least reference to the stereoscope. If it has, I pledge myself in future to place his claims above those of Mr. Elliott, whenever I have occasion to write or speak on the subject. Mr. Wheatstone's memoir is entitled *Contributions to the Physiology of Vision*, and I may well have known that he was preparing it for publication without the slightest knowledge that the stereoscope was to be one of the various subjects of which it treats.

As priority of publication is held by Mr. Wheatstone to establish the "originality of an invention," it may be sufficient to state to English readers that if this doctrine be admitted Sir Isaac Newton has no claim to be the inventor of Fluxions; Leibnitz published the method before him, but there is ample proof that Newton was the earliest inventor.

In the preceding observations I have avoided the offensive personalities with which this subject has been noticed in a silly article* in the *Westminster Review*. I have no personal feelings to gratify in giving an opinion on this question. As the inventor of the lenticular stereoscope now in universal use, and of other forms of the instrument, I, of course, feel an interest in the subject, and involving as it does nice questions in the theory of vision, that interest has been greatly increased. In preparing lectures on the philosophy of the senses, I had occasion to study the department of binocular vision, and in the *Edinburgh Transactions* for 1843 I have given the true and demonstrable theory of the stereoscope, after Mr. Wheatstone had wholly failed and acknowledged his failure. (*Phil. Trans.* 1838, p. 360.) That theory has now been before the scientific world for nearly 14 years, and has never been controverted. When the paper which contains it was written, I believed that Mr. Wheatstone was the sole inventor of the principle of the stereoscope, as well as of the reflecting instrument, and I never failed to give him the credit of both. He himself knows how I was compelled to investigate the subject, and to establish the claims of others—of ancient authors to the principle, and of Mr. Elliott to an instrument for exhibiting it.

I am, Sir, your obedient servant,
St. Leonard's College, D. BREWSTER.
St. Andrews, Oct. 22*nd*, 1856.

No. IV.

To the Editor of "The Times."

Sir—It is difficult to deal with Sir David Brewster's reasoning. I have proved by incontrovertible dates my priority both in the discovery of the principle of the stereoscope and in the invention of the instrument. Sir David, in his reply, fully admits these dates, and says, "it is evident that Mr. Wheatstone was acquainted with the principles of the stereoscope in 1833, and therefore earlier than Mr. Elliott;" yet he announces that unless additional evidence be brought forward he will continue to place that gentleman's claims above mine whenever he has occasion to write or speak on the subject; and he further requires a proof of my having constructed a stereoscope at the time my discovery was first announced. I cannot conceive why such a proof should be thought necessary, but I trust that the following evidence of Mr. Murray, of the firm of Murray and Heath, opticians in Piccadilly, will be deemed conclusive as to this point:—

"43, *Piccadilly, Oct. 27th.*

"Sir—From an examination of the accounts fur-

* The author of the "silly article" to which Sir David here alludes is a gentleman of the highest attainments and standing in the scientific world. His opinions, as there stated, we know to be a true reflex of the feelings of those who are best competent to give a judgment on this subject. We have obtained his permission to insert the article; since however he has deemed it right to withold his name, it would be unjust of us to mention it, although the clear and forcible style in which it is written will we think betray him.—Ed. L. & M. P. J.

nished to you by Mr. Newman, of Regent-street, during the time I was in his establishment, and which were prepared by myself, I am able to assign the date of my first knowledge of your stereoscopes, both with reflecting mirrors and refracting prisms, to the latter part of 1832.

"I am, Sir, yours faithfully,

"R. MURRAY."

"Professor Wheatstone."

The undue prominence given to Mr. Elliott's single experiment may lead some persons to imagine that the results he obtained were at least as perfect as those which I had previously produced; but it appears he did not proceed so far as to give the representation in relief of any solid body whatever. His attempt, as described by Sir D. Brewster in his recent work, was limited to represent three different flat distances, to either of which the eyes might be converged at will. The name "stereoscope" is quite inappropriate to an instrument exhibiting this effect alone.

Sir D. Brewster calls upon me to publish the letter I alluded to in my former communication, or "any part of it that has the least reference to the stereoscope." The correspondence, consisting of my letter and Sir David's reply to it (dated November 3rd, 1832), would be too long for insertion here. From the former I extract the following passage :—

"I propose in the ensuing session of the Royal Society to present two papers—one on the acoustic figures of which I gave a short account at the meeting at Oxford, and the other on binocular vision, in which I shall describe a series of very curious optical illusions, which I believe to be perfectly original."

But Sir D. Brewster, not content with disputing my claim to be considered the inventor of the stereoscope, denies, even if that were to be admitted, my claim to the discovery of the principle upon which it is founded. The real fundamental principle of the stereoscope is that clearly stated in my earliest announcement—namely, the apparent reproduction of a solid object by simultaneously presenting its two perspective projections, artificially delineated, one to each eye. I have yet to learn that any philosopher, either ancient or modern, had made this discovery before me, or had even nearly approached it. What Sir D. Brewster assumes to be the principle of the stereoscope is very different to this, and his endeavour to shew that the facts he has alluded to were already known to Euclid, Galen, Porta, and Aguilonius does not at all affect the point at issue. I shall not enter into any discussion on this collateral and comparatively unimportant subject, but proceed to shew that Sir David, when he was uninfluenced by his present feelings, took a very different view of the originality of the principle in question, even when generalized so as to include the phenomena of the binocular vision of real objects, than he now does.

In the *Transactions of the Royal Society of Edinburgh*, vol. xv., part 3, 1843, he says :—

"In prosecuting this subject, my attention has been particularly fixed upon the interesting paper of my distinguished friend, Professor Wheatstone, on some remarkable and hitherto unobserved phenomena of binocular vision. It is impossible to over-estimate the importance of this paper, or to admire too highly the value and beauty of the leading discovery which it describes—namely, the perception of an object of three dimensions by the union of the two dissimilar pictures formed on the retinæ."

When the originality of an invention of Sir D. Brewster's was formerly disputed, on somewhat similar grounds to those on which he has now impugned mine, he said, in words which have some present applicability—

"It has always been the fate of new inventions to have their origin referred to some remote period; and those who labour to enlarge the boundaries of science, or to multiply the means of improvement, are destined to learn, at a very early period of their career, that the desire of doing justice to the living is a much less powerful principle than that of being generous to the dead."—*Treatise on the Kaleidescope*, p. 137.

A public journal is not the proper place to enter into a public controversy on points of scientific theory, but I cannot allow Sir D. Brewster's assertion, that he has "given the true and demonstrable theory of the stereoscope, after Mr. Wheatstone had wholly failed and acknowledged his failure," to remain unnoticed. It is true that I have stated, and still believe, that there are some points requiring further investigation; but I venture to affirm that Sir D. Brewster has done nothing to advance our previous theoretical knowledge of the subject; and many of the views he has brought forward regarding the philosophy of vision I hold to be manifestly erroneous. In his recent work, and elsewhere, he misrepresents my facts and conclusions in a most extraordinary manner; and he attributes to me, without the slightest foundation, an hypothesis which I never for a moment maintained, and which I utterly repudiate. He makes no mention of some of my most important results, and, when he does borrow from my memoirs, unless he has a depreciating remark to make, he omits all mention of my name; and further, he entirely ignores the memoirs of those eminent writers who, since my first publication, have treated of the stereoscopic phenomena; and the names of Bruecke, Tourtual, Prevost, Moser, Volkmann, Dove, Rogers, Serre, &c., who have all brought much thought to bear upon the subject, are not even once mentioned in his pages.

I am, Sir, your obedient Servant,

C. WHEATSTONE.

Athenæum, Oct. 29th, 1856.

NEW DRY COLLODION PROCESSES.

In the December number of the "*Bulletin de la Société Française de Photographie*" we find the following dry collodion process, by MM. Meline and Montreuil, and if successful, which they say it is perfectly, is indeed a great step in the right direction. We confess that in our hands it has not quite answered all the expectations we might have formed on reading the description, but the success or failure of one or two persons is always a bad criterion of the value of a process. We insert it therefore in the hope that other more skilled or more fortunate experimentalists may meet with the promised success.

The glass, after being most scrupulously cleaned, is coated with collodion : for this purpose any collodion, new or old, will do; those

found most sensitive being mixtures of collodion residues, containing iodides, bromides, fluorides, &c. It is then rendered sensitive in the ordinary manner in a bath of nitrate of silver, 40 grains to the ounce, containing besides acetic acid and a little nitric acid. After removing from the bath the plate is washed with the greatest care in *common water* until all the free nitrate of silver is removed, and then allowed to dry, away from light or dust. When required for use the plate is to be dried over a spirit lamp, so as to prevent the film becoming detached in the various developing, fixing, or washing processes. The exposure varies between one and five minutes, according to the intensity of the light and the power of the lens.

The developing is conducted in the way recommended by Legray in his paper process (aqueous solution of gallic acid and a little nitrate of silver if required); and when sufficiently intense it is fixed either in a weak solution of cyanide of potassium or concentrated hyposulphite of soda, and then washed.

"Thus," say they "our process is less complicated than that of Dr. Norris, and is perfectly successful."

M. Dupuis has made known to the world through the pages of *La Lumière*, a modification of the honey, oxymel, glycerine, &c., processes in use in England.

The collodion which he uses is prepared as follows:—

Ether	Sp. gr. ·745	$6\frac{1}{4}$	fluid ozs.
Alcohol	„ ·849	2	„
Gun cotton		30	grains.

As soon as this is completely dissolved, the clear solution is poured off, and to every ounce are added $4\frac{1}{2}$ grains of iodide of zinc.

The exciting bath into which the plates, coated in the usual manner, are to be plunged, consists of —

Nitrate of silver	1 oz.
Distilled water	10 „
Glacial acetic acid	$1\frac{1}{4}$ „

Saturated in the ordinary way with iodide of silver.

After the plate is rendered sensitive, it is to be dipped into a basin of distilled water, allowed to remain there for a few minutes, and then washed under a gentle stream of pure water until the surface no longer appears greasy.

The solution of dextrine with which the plate is now to be coated is prepared in the following manner:—

One ounce of water is saturated with dextrine (British gum of commerce), and five grains of camphor added, to prevent its becoming mouldy. For use, this sirupy solution is to be diluted until it has a specific gravity of about 1·03.

When the sensitive plate has been thoroughly washed a small portion of the above solution of dextrine (which must be filtered just before using) is poured over it, and, after remaining for a few seconds, poured off, and replaced by a fresh solution of dextrine. This must be allowed to stay on the surface for a short time to permit of its perfect absorption by the film, and then poured off from one corner.

After being drained for a few minutes, the plate may either be put by in a box standing on one or two folds of blotting paper, to dry at leisure, or it may be dried more quickly, before a fire or over a spirit lamp, as a temperature of 120° to 140° Fahr. in no way interferes with the sensitiveness. It is, however, preferable to allow it to dry spontaneously.

Gallic acid, in saturated aqueous solution, will develope the latent image in the dry collodion, as well as in the ordinary albumen process, but M. Dupuis prefers the following solution of pyrogallic acid:—

Pyrogallic acid	3 grains.
Distilled water	2 ounces.
Citric acid	3 grains.

He has for some time past used citric acid in preference to acetic acid in the developing solution, both for wet and dry collodion; its price is much less, it is easier obtained, and great intensity is given to the picture, with perfectly opaque skies.

Just previous to developing, the plate is moistened with water, and then the above solution of pyrogallic acid poured over it. After remaining on for a short time it is poured off, mixed with 8 or 10 drops of a 20-grain solution of nitrate of silver, and then immediately poured back entirely and quickly over the whole surface of the plate. In a few seconds the image begins to appear, and rapidly acquires considerable vigour. As soon as the picture is sufficiently developed it is washed and fixed in a saturated solution of hyposulphite of soda; then well washed, dried, and varnished in the usual way. M. Dupuis considers that although collodion iodized with iodide of zinc is slightly less sensitive than when iodide of ammonium is employed, yet it is preferable for this purpose as giving superior results.

The iodide of zinc is prepared in the following manner. Add a slight excess of a solution of iodide of potassium to nitrate of silver solution (old baths, positive or negative, will do very well for this purpose), wash the precipitate well, until a drop of the washing water no longer precipitates nitrate of silver, then plunge into the paste of iodide of silver, a strip of pure zinc, adding a few drops of tincture of iodine to commence the decomposition. Metallic silver is reduced as a dark grey powder, and iodide of zinc remains in solution. By filtering the mixture, and evaporating the solution carefully to dryness, the salt is left very white and pure. It must be preserved in a well-stoppered bottle, as it is very deliquescent and liable to decompose by the absorption of oxygen from the atmosphere.

Mr. Sparling's Dry Process.*—At the second meeting of the Dublin Photographic Society, held on Wednesday evening, the 3rd of Dec., 1856, Mr. Sparling successfully developed the dry Collodion negatives deposited with the society at their last meeting, and which had consequently remained upwards of a month after being exposed in the camera previous to being developed.—*Journal of Phot. Society of London*, December, 1856.

* Vide *Liverpool Photographic Journal* Vol iii. p. 166.

CORRESPONDENCE.

PRELIMINARY EXPERIMENTS ON THE PRODUCTION OF WHEY FOR ACTINIC PRINTING.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—I have just finished a series of experiments on the whey process of impregnating papers, and I think I have found some reasons for troubling you with the following remarks on the proper state in which the calf's or lamb's stomach ought to be when procured, as well as the manner of preparing the rennet from it. The stomach of any *young* animal will answer just as well as a calf's, provided it be in a proper condition when the animal is killed. As in every other process, there has been great differences in the recorded results, which may, I think, be safely attributed to the condition of the animal as regards health and the state of the stomach itself. I have tested those of lambs from one to six months old, as well as those of calves from birth to four months; also of sucking pigs of about six weeks to three months old, together with those of rabbits whose age was unknown. I need not trouble you with all the details, for there was little generic difference found in those from the different species of animals which might not be traced to their age; the chief differences were found to depend on the *health* of the particular animal, and on the state of the stomach when killed.

The greatest strength of the rennet, *i.e.*, when the smallest quantity produced the best effect, is when the animal is from two to four weeks old, and when it has been killed before the digestion of the last meal has been perfected. As the animal increases in age, the *rennet*, or we may as well call it by its proper name, the *gastric juice*, possesses a greater degree of *solvent* power, for the milk, when coagulated by it, leaves too much uncoagulated caseine in the whey, which no addition of rennet will remove, but will only render it more muddy, and no filtration will clear it. I have found that the stomach of an animal which has been in a state of starvation for some days previous to being killed, contains in its juices very little coagulative power, and the less so as the length of time it has been without food; and further, that this may be carried so far as that the liquid in which such a stomach may be soaked, will not give a whey which will give the least sensibility to paper without the addition of chloride of sodium or ammonium; in short, it is no better for actinic purposes than ordinary fresh water.

A stomach, even when tolerably good, may be rendered comparatively worthless by too much soaking and scraping or rubbing; all the gastric juice may be removed from it, particularly when water containing lime in solution is used, and that, whether in a caustic or a carbonated state. A stomach is best prepared when it gets but very little washing; all the curd should be removed by wiping it as clean as possible with a cloth, and then only *rinsed* in water. On soaking a portion of such a stomach in water about 75° F., it will give out the gastric juice freely, consisting of chlorides of sodium, ammonium and hydrogen; and the proportions of these will vary with the activity of the digestive power at the time. When this liquid is in its best condition of condensation, viz. 3° R of the actino-hydrometer, it will produce a tolerably clear whey which will require no addition of any chloride whatever to produce the full effect on the impregnated paper; but to do this, it is essential that the stomach be not empty when the animal is killed. Free chloride of hydrogen *(hydrochloric acid)*, is indispensable for producing the best effect in coagulating the milk, so as to get a clear whey, and this appears to be wanting in a stomach which has been some time empty. The action of this *free* chloride appears to be *catalytic*, for it is still free in the whey in as great a quantity as before, while if it be neutralized either by soda or ammonia the whey will not be clear, nor will the paper impregnated by it be so sensible, or its tones be so intense when printed on stomachs of animals that may have died of disease, or that have "been killed to save their lives," contain no free chloride of hydrogen, and the muddy whey produced by their gastic juice can hardly be said to be so good as plain water, unless a few drops of hydrochloric acid be first added to it. I have also found that the greater the tinge of yellow the juice shews, the greater its coagulative power, and this is in fact the only criterion we have of judging by the eye which of two samples is the best, or most likely to produce a proper whey.

Whether any part of the effect on the paper is due to the organic principle *(pepsine)*, always present in healthy gastric juice, is uncertain; but it most probably is, as we know that no artificial mixture of the chloride salts will produce the same effect on paper as the whey, any more than they will dissolve the food in the stomach where pepsine is absent. This substance is dissolved out of the membrane of the stomach by soaking in water, and hence the deleterious effect of too much washing and cleaning the stomach with water. Any impurities left on the stomach and separated in the water may, without detriment, be removed by filtration, and it is doubtless to this excessive washing, as much as to the starvation or health of the animal that so many of the recorded discrepancies of practitioners are to be attributed.

I do not believe the addition of Sir W. Newton, viz. camphor, is proceeding in the right direction, but no judgment can be correctly formed without knowing the preparation of the *rennet*, as in the cheese districts all the stomachs are preserved and cured in salt, which is itself included in what is called "*rennet*," and is added to the milk to be curdled when mixed with the juice extracted from the stomach. The quality of this salt would alone suffice to impregnate ordinary paper with sufficient chlorine; although chlorine alone is unadapted for this purpose, seeing that it contains nothing to neutralize the nitric acid set free when the chlorine combines with the silver of the exciting bath, which would otherwise corrode the paper. A base of some kind *must* therefore be combined with the chlorine, so that by double decomposition it may combine with the acid of the nitrate of silver.

I draw the conclusion, therefore, that all stomachs, even of the same species of animal and of the same age, will present different degrees of fitness for actinic purposes, according as the animals were healthy or not, as well as whether they were or were not killed on an empty stomach. So much difference may exist as that one may be in the best possible condition, while another may be worthless; also, that a stomach otherwise good may be greatly deteriorated by over-washing in preparing it for use. The *albumenous* substance of the whey does not appear to be affected in its proportions whether the stomach was empty or not; whereas, in a diseased stomach it was lessened, and in some cases scarcely a trace of it could be detected. What part this albumenous body plays in the process I have not been able to ascertain; yet I do not think it can be of importance, seeing that in some cases where the stomach had been empty it appeared in its full quantity, and yet still the paper impregnated therewith gave evidence of little sensibility, with a very weak impression, indicating a deficiency of chlorine as compared with other simple chloride paper. WM. ROSS, Architect.

26, *Second Avenue, New York,*
Sept. 12th, 1856.

ANSWERS TO CORRESPONDENTS.

Communications for the EDITOR *are requested to be sent to* MR. WILLIAM CROOKES, 15, STANLEY-STREET, BROMPTON, LONDON. *Correspondence on the* business *of the Journal to the* PUBLISHER, 16, CANNING PLACE, LIVERPOOL.

M.R.A.—It is unimportant whether a portrait or landscape lens be employed for copying positive collodion pictures. If they are small, a double combination will give the most luminous image; if large, a single lens will probably answer best; taking care that the focus is fully defined to the extreme corners.

W.W.—1. Hollingworth's paper is spoken of very highly by many, but we cannot say whether it is the best in the market or not. 2. We cannot recommend any particular maker.—See Advertisements.

X.—The light grey deposit which is formed in a developing bath of proto-nitrate of iron containing nitric and acetic acids, and which has been repeatedly used, is metallic silver. To convert it into nitrate, sufficiently pure for use, would require some knowledge of chemical manipulation, and a supply of apparatus for the purpose; we should advise our correspondent to filter it, wash well, and then dry it: any manufacturing chemist will now take it in exchange for, within a trifle of, its own value of nitrate of silver.

PHOTO.—We suspect that the grand cause of the fading of positives is imperfect washing. Soak a piece of paper in bichromate of potassa, and see the difficulty of washing all the colour out of it by the way usually adopted for washing positives.

?.—Send a print, and we will then try and solve the difficulty; your description is not sufficiently explicit.

C. HAMMOND—1. If a small quantity of *kaolin* (white china clay) be shaken up with your discoloured positive exciting bath, and then the solution filtered, it will become clear and colourless. 2. Pyrogallic acid has been employed by some, in conjunction with nitric acid, for developing collodion positives, but we prefer the tone given by proto-salts of iron.

J. S., HAMPSTEAD.—From the appearance of the print you have enclosed, we think the negative is an excellent one. The print does not do justice to it.

F. S., WOLVERHAMPTON.—If a collodion positive bath be kept free from light and air, and has been prepared in the usual way, it will most likely give as good results when tried after being kept for any moderate time as when first put by. Theoretically there are decompositions constantly going on which might perhaps tend to slightly deteriorate it, but they are however, so minute, that for all practical purposes we should consider they might be regarded as having no influence either way. After all, would it not be the easiest plan to try it; if it be good, well; if bad, a fresh bath can be made in a short time.

G. W. C.—The simplest plan to recover the silver from old baths is to add a few drops of nitric acid, filter from sediment, and then place the solution in a jug, and plunge in a large, clean piece of sheet copper. Now stand it on the hob or in any hot place for a day or so, and the silver will be precipitated in the form of a grey, crystalline powder, partly adhering to the copper and part at the bottom of the jug. Gentle agitation will separate it from the copper, which must now be taken out, and the silver powder remaining can be washed either by decantation, or, better, by filtering and washing until a drop of the water which runs through produces no red stain on a steel knife. For remainder see answer to X.

J. F., OXFORD.—The proportions we prefer are three parts, by measure, of alcohol, and five parts of ether, both pure and anhydrous. They are taken from Mr. Hadow's paper (Jour. Phot. Soc. of London, vol. I., p. 178.), to which we would refer you for the answer to the other query.

LUX.—Your suggestion is received with thanks.

Y. Z., M. N., Q.—Received.

Printed by the Proprietor, HENRY GREENWOOD, of No. 14, Fairfield Crescent, in the Parish of West Derby, at his Office, 16, Canning Place, Custom-House, Liverpool.—Jan. 1, 1857.

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The
Liverpool & Manchester Photographic Journal.

New Series. No. 2.—JANUARY 15, 1857.

The fourth annual exhibition of the Photographic Society of London, 5, Pall-mall East, was honoured on Friday, the 2nd inst., by a visit from their Royal Highnesses Prince Albert, the Prince of Wales, the Princess Royal, and Princess Alice; attended by the Hon. Beatrice Byng, Miss Hildyard, Col. F. H. Seymour, and Mr. Gibbs. The members of the Council of the Society were in attendance. The Royal party, for upwards of an hour and a-half, examined the numerous and beautiful specimens there exhibited, with great interest and attention; and H.R.H. Prince Albert expressed his gratification at the great progress which had been made since the previous exhibition.

In the afternoon the members and their friends had a private view, previous to the gallery being thrown open to the public on Saturday, the 3rd instant. It is a great pity that the society find such difficulty in meeting with exhibition rooms of a size proportionate to the number and importance of the pictures exhibited. The many screens and tables which it is necessary to crowd into this not over-large room, in order to provide sufficient accommodation for the numerous exhibitors, were painfully in the way of the great number of visitors assembled together on this occasion; and even then several very excellent pictures were so placed as to necessitate the ungraceful attitude of "all fours" to obtain a satisfactory view of them.

It is our intention to give such a careful analysis of the contents of this exhibition that those of our readers who are prevented from visiting it may be enabled to form a tolerably correct opinion as to the present state of the art in this country. It is remarkable as being the first exhibition in which there are many examples of the subserviency of means to effect; and it contains also such ample proof that photography is ere long destined to rank by the side of painting and sculpture as a sister art, and not at their feet in the position of a handmaid, that it cannot fail to strike the most casual observer that the days of merely mechanical photography are numbered.

At the time when photography was just struggling into existence, far from demanding artistic effect in the first crude yet wonderful productions of those patriarchs of the art, Talbot and Daguerre, our only feeling was one of admiration and wonder at there being *any* permanent record of the fleeting images in the camera. Success, at all commensurate with the labour and time bestowed upon each individual picture, was so rare, and even when most satisfactory, the process was so encumbered and embarrassed by the complicated manipulations and defective physical and chemical appliances which beset each operation, that it would have been but a waste of skill and time to have attempted obtaining any artistic results, but those which would suggest themselves almost spontaneously to an educated eye in arranging the subject to be copied.

Thus, it was natural that in our earlier exhibitions almost every picture was merely an illustration of some process. The photographic part was most prominent, and the points to be commented on were the rapidity with which the picture had been taken, the minute detail given in one part, or the correct gradation of half-tint in another. So long as the subject was accurately copied the beauty or general interest of it was hardly thought of, and consequently, family portraits and objects of purely local interest were of most frequent occurrence in our galleries.

But photography, like every thing else, obeys the universal onward law. The rapidity of its progress is without a parallel in the whole history of art, each day bringing forth some new and ingenious appliance, which, while it tends to facilitate the mechanical part of the operation, leaves the manipulator free to exercise his artistic skill.

Now comes the rivalry—not in manipulation between skilful and well tutored hands, for the processes have at last been brought to such perfection of simplicity that almost every one who chooses to devote a few days to practice may expect success. The energy and skill of our photographers does not exert itself in vieing with each other as to who can cover the greatest number of square feet of glass or paper at one time; the emulation now is for other and nobler objects, and, consequent upon the change, photography is elevated from a mechanical occupation into its proper position as one of the fine arts.

Therefore, in coming to a decision on the absolute merit of any of the works here exhibited, preference must be given to those which shew evidence of the operator's intellect being concerned in their production, rather than to those which merely record that he has a good lens, sensitive collodion, and has overcome the mechanical difficulties of the process.

We have before us catalogues of the three principal photographic exhibitions now open, and we cannot refrain, previous to entering more minutely into the quality of their contents, from remarking on their physical characteristics. The neatness and care with which they are got up seems to be in an inverse proportion to

their price. The Manchester catalogue, twopence, is by far the best, both in size, outward appearance, neatness and arrangement of matter, and amount of information contained therein; that of Edinburgh, fourpence, is very fair; while the London catalogue, price sixpence, is, to use the very mildest term, a disgrace to the society. The paper is bad; order and arrangement seem to be entirely wanting; the information is of the most meagre description: whilst the clumsy manner in which the leaves are tied together renders it next to impossible to make the same copy remain entire during two visits.

M. de La Blanchère, an eminent continental photographer, has lately presented to the French Academy a description of a very rapid waxed paper process, with theoretical and practical ideas on the subject. His memoir is not yet made public, but we understand that the process is very simple, and almost as sensitive as moist collodion, since he has been enabled to obtain potographs of clouds. He enters very fully into the subject, discussing the composition of the iodizing bath, and the organic matter necessary to be introduced by way of *size* into the paper. Stress is laid on the advantages to be derived from *re-iodizing* the paper, but in what way we have not yet ascertained. Pictures taken by this process have a peculiar and very remarkable appearance, and have excited universal admiration.

Method of Fixing Positives. By M. Vernier, jun.—The paper being prepared with chloride of silver in the usual way, and placed in the pressure frame, the exposure is prolonged until the shadows of the picture are very deeply printed so as to have all the detail in the light parts. Five to ten positives are printed one after the other, and then they are all completely immersed in a large quantity of weak solution of salt. In a few hours the water is changed, and in the evening they may be fixed. For this purpose a solution of chloride of gold, in sufficient quantity to cover a picture, is poured into a flat dish, and one of the prints laid in it; the dish is now gently tilted backwards and forwards until the picture is sufficiently toned down, and then the latter must be well washed in abundance of clean water. The other pictures are now to be treated in the same manner, and then the whole are to be allowed to soak all night in a large basin of clean water. They are afterwards to be fixed by soaking for at least half an hour in a solution of hyposulphite of soda (one to fifteen), and then for the same time in a solution of an alkali (one to ten), afterwards washing as usual.—*Cosmos.*

[No particular alkali is mentioned; we have found carbonate of soda answer very well.—*Ed. L. & M. P. J.*]

The powers of photography have very recently been employed with great success in producing a number of fac-simile copies of the *codex argenteus* of Uphilas, the oldest (fourth century) sample extant of the Gothic language, the great mother tongue of the whole Germanic stock.

LIVERPOOL PHOTOGRAPHIC SOCIETY.

The first meeting of the fifth session was held at the Royal Institution, Colquitt-street, on Tuesday evening, January 6th. Owing to a meeting having been announced for the 23rd, the third Tuesday in the month, there was but a slender attendance, the majority of the members being under the impression that that meeting had rendered the present one unnecessary.

C. Bell, Esq., one of the vice-presidents, who occupied the chair, made some observations, in opening the proceedings, as to the desirability of more attention being paid in Liverpool to the study of optics in connection with photography. He thought they should endeavour to persuade some of the opticians in the town to take a more active part with them; for he was persuaded that a great deal had yet to be done with regard to the lenses of cameras. He had brought with him to the meeting a small camera with two lenses, which he had got Mr. Chadburn to grind for him. They were simple Meniscus lenses, of rock crystal. For a stereoscopic camera he thought they were the most convenient and effective he had ever seen. In illustration of his remarks, Mr. Bell exhibited a picture taken with this camera. It was quite stereoscopic, and as good a result as could be expected in weather such as we have recently had. Lenses of this description he explained were much quicker in action than glass lenses. The picture was exposed three or four seconds. He also explained an invention by Mr. Long, by which he adapted his plate-box to his camera, enabling him to carry a dozen dry collodion or albumen plates in a box, which he hinged at the back of the camera, with a simple India-rubber band round the bag. There were sleeve holes, enabling him to open the box backwards, and take out the plates without difficulty.

Mr. Forrest, the treasurer, stated that Mr. Atkinson was making a stereoscopic camera upon the principle of Mr. Berry's large camera, exhibited before the society in July last, and which was found to be admirably adapted for the purpose of a stereoscopic camera.

Mr. Keith, the Secretary, said he would endeavour to borrow one for exhibition at the next meeting of the society (on the 23rd instant.)

The Chairman. recalling the attention of members to the subject of lenses, said they must, after all, look more to the opticians. They did not pay sufficient attention to the simplicity of lenses. It was no doubt to the interest of the optician to sell as many of his high-priced lenses as possible, and he would not make the low-priced ones until pushed. He thought every photographer would have a stereoscopic camera if the great drawback of expense was removed. The cost of the lenses in the small camera he had produced was very much less than those ordinarily used. The *foci* were the same; but if not they could be easily adjusted by the slide.

Mr. Forrest stated that, with the view of bringing forward practical results, the council had appointed a committee to make experiments with the three leading dry processes at present before the public—the Gelatine, the Dextrine, and the Oxymel. It was intended to bring the results before the society, in order that members

might arrive at a conclusion as to which was the best in point of manipulation and certainty. The weather had been very much against them lately, and the illness of their respected vice-president, Mr. Corey, had prevented him from performing his part of this duty. He (Mr. Forrest) fully hoped, however, that the experiments would be ready to be submitted at the meeting on the 23rd.

Mr. KEITH read a circular, a copy of which has been advertised in this journal, announcing that a patent had been taken out for producing photographic pictures upon enamelled metal *tablets*, papier maché, and other substances.

Mr. FORREST thought the chairman would recollect some Photographic specimens on sheet iron, japanned, from America, being laid before the society.

The Rev. Mr. BANNER: And others prepared on leather.

Mr. KEITH: I have seen others in London on porcelain, and I have myself taken portraits on porcelain.

Mr. R. COOK thought the patent would not hold good, containing only what had been done before.

On the proposition of Mr. J. A. FORREST, Mr. J. B. Moss, of Minshull Street, and Mr. JOHN HICKSON, of Derbyshire, were elected members of the society.

The CHAIRMAN feared that nothing had been done lately with direct action sun printing.

Mr. KEITH had tried two whole day's exposure, and by keeping eight or ten frames going he could produce a batch at the end of a week for fixing.

Mr. BELL was inclined to report favourably of Mr. Long's process for positive printing by development. Encouraged by the speeimens he had obtained in London, and which he exhibited at one of the meetings of the society, he had procured paper, and on making experiments he had found that it was possible to produce everything that could be desired. His experience fully bore out Mr. Long's statement as to the cleanliness of the process. The gallic acid did not turn black or dirty, a very great advantage in the development.

Mr. FORREST said he had been working the process for the last twelve months: and Mr. R. COOK said that he and his brother had done so for years. There were some little difficulties attending it, which in fine weather made them half inclined to lay it aside. It had however a very great advantage in winter.

Mr. R. COOK produced some negatives taken by himself and Mr. Alexander Cook, on wax-paper, on Christmas-day. They had used Canson's paper, procured from Mr. Chadburn a few weeks ago. The process was a modification of Mr. Fitt's. They had the remains of several iodized solutions, which they mixed together. There was a rather larger proportion of iodide of potassium than usual, and a very strong silver bath, more than 30 grains to the ounce.

Mr. KEITH: In this cold weather it is necessary to increase the strength both of the iodizing solution and the silver bath.

Mr. COOK: Formerly we could not get the black sky until we increased the strength of the solution. There was one fault with wax-paper: they could get no very great distance. In one of the pictures there should be some iron works in the back ground, but they are quite lost.

The negatives referred to were circulated about the room, and were greatly admired. They were views in the Vale of Llangollen, one being a beautiful representation of the Keeper's House, picturesquely situated in the heart of a wood in Wynnestay Park; and another of a Water Mill, on the Dee. The gamekeeper's house took fifteen minutes exposure in the brightest part of the day. There was snow on the ground, and Mr. Cook said they had no little difficulty in keeping themselves warm during the time.

The CHAIRMAN scarcely expected that December would be productive of such excellent photographic fruits as these.

Mr. R. COOK said he had brought these results partly with the object of refuting the argument, frequently advanced at their meetings, that over-exposure was the cause of failure in wax-paper negatives. He did not believe it at the time, and he had now found that it was not the fact, but that the failures arose from a weak silver bath and the want of acetic acid.

In the bath used on this occasion there were of

Water	15 oz. avoir.
Nitrate of Silver	1 oz. „
Acetic Acid	2 oz. „

Mr. FORREST was sure the meeting was much obliged to Mr. Cook for bringing his negatives forward. It was by the announcement of practical results of this kind that so much benefit was conferred upon the art.

Mr. FORREST threw out a suggestion, that on the arrival of spring, the members should make photographic excursions on particular days, the various processes being represented and tested, and the results compared.

The idea was declared to be an excellent one, Mr. Bell and Mr. Cook declaring their willingness to join in an undertaking calculated to be productive of such interesting results.

In answer to Mr. Cook,

Mr. FORREST stated, that the negociations with the Historic Society, relative to the suggested amalgamation, had fallen through, but that the Historic had done them the honour of electing their officers honorary members of that society, a compliment which, he was sure, they would all have pleasure in reciprocating.

The proceedings then terminated.

LIVERPOOL PHOTOGRAPHIC SOCIETY.—The next meeting of this Society will be held at the Royal Institution on Tuesday, the 20th instant, when Mr. Doyle will exhibit a plan for a stereoscopic camera, and Mr. Atkinson will exhibit a new transfer box for stereoscopic cameras; after which a discussion will take place on the dry collodion processes.—WM. KEITH, *Secretary*.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THIS society held its third meeting of the present session, at the house of the Literary and Philosophical Society, No. 36, George Street, on Wednesday Evening, the 7th inst.

Dr. FRANKLAND, F.R.S., occupied the chair, and the attendance was very numerous. Several new members were elected.

The SECRETARY (Mr. Cottam) reported that the

council had completed the selection of pictures for the new number of "Photographic Illustrations," by the choice of a calotype view of the entrance porch of Haddon Hall, and a wax paper view of Conway Castle, both by members of the Society; a beautiful print of the portrait of W. Fairbairn, Esq., by Mr. A. Brothers, was also exhibited, framed and glazed, we believe for presentation by the Society to the Literary and Philosophical Society, in whose rooms this Society meets. The portrait is an exceedingly characteristic one of our respected fellow-citizen, and is a good specimen of photography, and, being untouched, will bear comparison with many of more ambitious pretensions. Some photographic delineations, from the life of South Australian natives, afforded much interest; as did also some choice specimens of French and other pictures, by Messrs. Baldus, Bisson, and Bilordeaux, kindly lent by Mr. Grundy.

The Rev. W. J. Read, M.A., F.R.A.S., read a paper entitled "*Visits to the Society's collection of Photographs, now exhibiting at the Mechanics' Institution*," from which we quote the following, want of space preventing our giving his remarks upon the various subjects exhibited:—

"In preparing the paper which I have now the honour to read before you, I have had two principal objects in view—first, to assist in making the present exhibition as useful as possible to photographers, by particularizing the chief lessons it teaches us; and, secondly, to add something to its interest for those who are not of our brotherhood, by guiding them to its most remarkable features, and shewing wherein lies the beauty or the usefulness of the pictures it contains, the course of my remarks necessitates something of criticism, and though happily I may use scarce any but a laudatory tone, I find it very difficult to read my critique as I am required to do, in the presence of those whose works are under examination. An anonymous writer, trained by long practice to fix upon the salient points that deserve commendation or blame, is hardened by his very practice into something like carelessness for what pain he may inflict, and screened at the same time from temptation to flattery by the cover under which he writes. Whereas I have nothing to keep me from either extreme of severity or laudation but the straightforward, honest purpose to say what requires to be said; and I throw myself without reserve upon the good feeling and forbearance of you all, while I proceed to examine the beautiful productions of our art, you have combined to bring together.

"Now, as an exhibition of photography, our own may, I believe, take rank with the very finest the world has yet seen. It illustrates almost every process yet invented. It contains examples of all the greatest of our own artists, and of very many continental name of note. It exhibits almost every use that can be made of the art in depicting portraiture, architectural, topographical, and botanical details—in reproducing works of art—in recording scenes of local and of historical interest—while in landscape scenery, it sets before us with magical fidelity, every aspect of nature from the rushy brook and babbling water-fall, to the weary mountain pass, and the deathly hush of these stupendous glaciers. Here the English cottage garden smiles on you in trim simplicity—there the Italian palace lifts itself above the quiet waters in mournful solemnity of splendour. Side by side with the monumental relics of antiquity stand the strongholds of feudal tyranny, and the mightiest achievements of modern constructive science—steam.

"France, Italy, Greece, Egypt, Syria, visit us in our own land, and we may take our choice whether we muse amid scenes of sacred story, or wander with the classic or middle-age historian in their now shadowy distance; or with more glowing thoughts, gaze upon heights and ramparts glorified by the patient, pious, zealous valour of our own acquaintances and kinsmen. One lack strikes me as somewhat curious. We have many views in Wales, one or two in Scotland, but not one that I have noticed, of Irish scenery. Let us hope that our tourists next season, will some of them venture a little further, and bring those of us who cannot stray so far from home, to some acquaintance with the natural features of our Sister Isle. It is unbrotherly in us not to know them.

"The geologist, the botanist, the microscopist, may learn what sort of assistance photography can lend them in their several studies; while the student of Ethography may find a still more amazing promise of help in the series of Australian portraits which is among the latest contributions to your collection.

"But while very much that we have is shared with us by most other similar exhibitions, we have much entirely our own, in local scenery and home interest. Our churches, our old halls, our industrious vallies—our thronged familiar streets are present on our walls, not perhaps in such numbers as we hoped and intended, but still numerous enough to give a character to the exhibition, and to make it not unworthy of the name of our Society and our city.

"Of the particular characteristics of the pictures we must speak in fuller detail hereafter; but to the rapid glance we have here taken at the varied nature of the subjects they illustrate, may well be added an expression of high admiration for their general beauty. I suppose that even the most succesful artist would be somewhat startled by the very high standard of excellence which is maintained in these pictures: and, certainly, the less successful among us may be in danger of having their emulation crushed down into despairing disgust. There are here no muddy, foggy, or flat pictures. 'Soot and whitewash—soot and whitewash'—some one said of some of the productions of our art; but how little is here to which the most contemptuous or cynical critic could attach such a designation. Vigour of contrast is secured with perfect transparency of shadow and marvellous minuteness of detail—while, indeed, in some pictures the aërial perspective gives effects as fascinating as they are rare.

"The exhibition is, however, to speak frankly, in an unfortunate position for the full display and general appreciation of its excellencies. Forming as it does part of a most miscellaneous collection, it fails to draw to itself the attention which it would have commended had it been by itself. It is visited, doubtless, by many who would not have seen it by itself; but unfortunately the same circumstances tend to diminish and dilute its interest to those who would have been most engrossed by it.

"Before visiting the exhibition, I made a sort of statistical survey of the catalogue which was put in my hands. I counted how many names were given, not of contributors, gentlemen who sent pictures, but of artists, that I might ascertain how many persons had been engaged in taking all these pictures. This number I found to be sixty-one, of whom not more than twenty are now members of our Society.

"Of pictures printed from calotype negatives, there are 76; from waxed paper, 138; from albumen, 21 from collodion, 357; and from dry collodion, 7. These numbers afford a very fair and trustworthy measure of the comparative usefulness of these processes

It is not merely the ease of manipulation which secures for a process such a decidedly greater adoption, as appears here to have been obtained by the collodion process, but also its completeness of adaptation to every variety of purpose. We see here pictures of very large size, and representing the grandest scenery of Europe, successfully taken by the very process upon which most tyros make their earliest attempts, notwithstanding the many laborious conditions imposed by its requirement of immediate operation, aud the impatience of delay wi.h which it balances its boon of sensitiveness. Now that we have a near prospect of the removal of this restriction by the processes of Mr. Barnes, Mons. Taupenot, Dr. Norris, and others, the statistics of our exhibition lead to the expectation that collodion will still more supersede all paper processes for the production of negatives.

"And the character of the exhibition enables us, I think, to look forward to this result without much apprehension. For the pictures taken in this way quite equal, if they do not, upon the whole, excel, those of older processes. The original calotype still displays its beautiful brilliancy of light and shade, its clear, bright sunlit effects, but not without something of harshness in its contrasts. The waxed paper takes precedence of calotype, not only in its numbers, but in the general softness and delicacy of its details, and the truthfulness of its rendering of atmospheric effects. The few albumen pictures—some of which are indeed very fine—yet fail in my judgment to establish, for the somewhat tedious plan by which they are taken, any decided or commensurate superiority over any of the other processes. They are scarcely less harsh than calotype, and, at the same time, inferior to the waxed paper pictures in atmosphere and distance; while collodion fully rivals them in delicacy and definition. We have only one example, and that added within a few days, of Taupenot's collodion-albumen process; but that is one vindicating the usefulness of dry or protected collodion, having been taken upon a dull and foggy day.

"Of the positives upon glass I will only say that I congratulate the Society upon its anticipation of a description by Mr. M'Lachlan, of the niceties of preparation by which he is able to produce the very beautiful pictures to which he has confined his attention. Though several of the pictures of this kind approach his, there does not seem to be the same uniform combination of brilliant tone in the lights with delicately rendered shadows. Pictures of this kind ought scarcely to be looked at by artificial light—so much duller and flatter do they appear than in the full blaze of daylight.

"Considering then, as I do, that our exhibition establishes more fully, at least for ourselves, than any before it, the very great usefulness of Mr. Archer's collodion process, which we see here to combine the most distinctive excellencies of many other photographic process, adding some peculiarly its own, I venture to suggest the question, whether it would be unworthy of our Society, or ungraceful in it, to offer to him some testimonial of our appreciation of the boon he has given to photography.

"Those of us who live to see and to contribute to another exhibition will, I hope, fill up what seems to me a deficiency in our present one. Many of our members are not adepts but only students, and to them a small collection of first-rate negatives would certainly be useful; and it would be a matter of interest to the visitors, unacquainted with the details of the art, to compare the dingy, black-looking, unintelligible negative, with the sunny completeness of the mounted proof. The negative might be mounted between two sheets of glass pasted together at the edges."

The reverend gentleman then entered very fully into a detailed examination of the most striking and important pictures exhibited, which will be treated of in our next number, and concluded with the following remarks :—

"I cannot forbear, in conclusion, availing myself of the opportunity here afforded of drawing a comparison between photography and painting. After what I have already said, the most ardent photographer will give me credit I hope for full appreciation of his art; and yet I can never return from the picture gallery to our own rooms without feeling a greater lack than that of colour, the lack of human passion—human sympathy. The photographic pictures acquire their interest in the thoughts of the spectator—they have generally far less influence over his feelings than a well conceived painting. To be roused or excited in any degree by a photograph, you must have invested the scenes depicted in it with the glow of an instructed imagination, or the tenderness of well-remembered associations. It is seldom that a photograph reveals a story, and only when the story which gives interest to the picture is known, do its subtle beauties and its rare fidelity win their way to the heart. There seems to be a something in the passionless, still repose of the calm outlines, which repels instead of invites the restlessness of the human spirit, whether disturbed by joy or by sorrow; and it is in a very hermit temper that one regards with most pleasure their unpeopled beauty.

"The painting, on the other hand, seizes us with the irresistible force of strong imagination: it takes us out of ourselves, and reveals to us, as in a trance, the emotions, the sufferings, the history of the best, and bravest, and loveliest of our race; and throws over our hearts a spell of oft-recurring power, nerving us for action and calming us in distempered or perturbed hours.

"Let us then claim for photography its true worth and dignity in its position as the servant of genius; the steward, I would say, of the materials with which genius may work, who provides and preserves for his use all that he can ask for, when building up his most impassioned creations. A talkative steward he is to those who care to converse with him: one that tells many of his master's secrets, and babbles lovingly of all his master's toil; and for us a friend who takes a loving charge of all we commit to his keeping, and faithfully preserves in amaranthine freshness, whatever tender memory his storehouse has at any time received."

In consequence of attention having been drawn in this paper to the fact that the majority of the pictures in the Society's Exhibition, are from collodion negatives, it was resolved:—

"That as an acknowledgment of the eminent services of Mr. F. Scott Archer, the inventor of the collodion process in photography, this society join in the subscription for a testimonial to that gentleman; and that a circular be sent to the members, requesting their assistance."

It was announced that arrangments had been entered into, by which this Journal would in future be the organ of the Society, in place of the "Photographic Notes;" the connection with which has been given up, in consequence of the delay caused by the distance between the Society and the editor.

The members present expressed their hearty approval of the change.

A letter from Mr. Sutton, assuring the members of his continued good wishes, and willingness to serve them, was read.

A letter from A. Braun, Esq., of Mulhouse,

was also read, acknowledging the honour done him by electing him an honorary member.

A conversation ensued regarding several dry collodion processes, and Mr. Sidebotham produced some very beautiful specimens of the collodio-albumen process, which excited much attention.

LONDON PHOTOGRAPHIC SOCIETY.

THE third ordinary meeting of the session took place on Thursday, the 8th instant. Sir W. J. Newton occupied the chair.

After the formal business of the meeting was concluded, the CHAIRMAN made some remarks on the large white margins of several of the pictures in their exhibition. The rooms were so small, there were so very many pictures sent, and there was such a superabundance of white margin, that he had thought it necessary to withdraw his own in order to make room for others. Sir William concluded by remarking that there should be a stringent law passed by the Society that the space between the edge of the picture and the frame should in no case exceed three inches.

A letter from Mr. Kater was read, in which he stated his wish to resign the office of vice-president, on account of ill health requiring his absence from England. Dr. Diamond was mentioned as a fitting person to be nominated as his successor at the next general meeting.

Matthew Marshall, Esq., and F. Horne, Esq., were appointed auditors.

Mr. HEATH (of the firm of Murray and Heath, Piccadilly) exhibited and explained an ingenious contrivance by N. S. Maskelyne, Esq., of Oxford, for carrying about sensitive dry collodion plates of a large size, and transferring them to and from the plate-holder without the necessity of being in a darkened room. A full description of this will appear in our next number.

Mr. HARDWICH then read a paper "*On the Impurities of commercial Nitrate of Silver*," of which the following is an abstract:—

In the first condition no impurities can be detected on chemical analysis, but the bath, when prepared, gives unusually feeble negatives of a leaden tone, and often free, or nearly so, from reduced silver in the high lights; and if the exposure be prolonged, the action of the light may be reversed, and the image be *positive* by transmitted light. The proper remedy appears to be to melt the nitrate of silver; and the author is of opinion that the crystals of nitrate, obtained from the acid molten liquor, are not in a fit state for photographic purposes, but should be purified by fusing, and subsequently re-crystallized.

Organic matter is also occasionally met with in commercial nitrate of silver. The salt has then a peculiar smell, like that of alcohol decomposed by nitric acid, and gives red and intense negatives, with no gradation of tone. This impurity is doubtless introduced by evaporating old baths to dryness, and treating the residue with nitric acid, but this process is not, by any means, to be relied upon.

The author has also made a series of experiments on the effect of introducing organic bodies into the nitrate of silver bath, and the conclusions at which he has arrived are, that the action of the solution may be affected in various ways, and that this point is one of great importance. As the bath gets old it may lose sensitiveness, and produce spots and markings of different kinds upon the pictures.

Lastly, he urges that due attention should be paid to the preparation of pure nitrate of silver, a photographic chemical of equal importance with the collodion itself.

A communication was then read from Mr. Sims, "*On Engraving Glass Photographs by means of Hydrofluoric Acid Gas*," of which the following is an abstract:—

The points to be kept in view by persons wishing to engrave photographs on glass are the following:—Obtain a strong metallic deposit, with as weak a collodion film as possible, in order to diminish the resistance which the film offers to the free action of the hydrofluoric acid gas on the transparent parts of the picture. Develope with the salts of the protoxide of iron, as the precipitate, in this case, is more compact. Wash the impression well, and dry it evenly. Heat to dull redness if a deep engraving is desired, but if merely an effect like a daguerreotype on glass is wanted, a stronger heat is necessary. An exposure for two or three seconds over the vapour of hydrofluoric acid will produce the required result. A good photograph, burnt slowly with a low heat, will stand the action of moderately strong hydrofluoric acid gas from 10 seconds to several minutes, according to the strength of the photograph.

Some discussion then ensued upon the subject of this paper, in which Mr. MALONE and Mr. SIMS took an active part.

The SECRETARY then read a letter from C. Babbage, Esq., in which the following suggestions and queries were thrown out as being very important points in the theory of photography, and well worthy the serious attention of all investigating photographers:—

Does the degree of darkness depend upon, or is it influenced by—

1. Colour alone.
2. Colour, its chemical composition.
3. The nature of the process (Daguerreotype, Calotype, &c.)
4. Colour, the nature of the fluid holding it in suspension, (gum, oil, alcohol, &c.)
5. Colour, the nature of the surface (glazed or unglazed), the substance itself (paper, porcelain.)
6. Are the relative intensities of the same colour, but of different shades, the same at different times of the same day?
7. Are those relative intensities different on different days?
8. Are the relative intensities altered by the nature of the process?

Accompanying this letter, and as an illustration of some of the points here mentioned, were specimens of all the colours used in porcelain painting, burnt in squares on slabs of glazed porcelain, with some daguerrotype copies of the same. These exhibited in a most striking manner the total dissimilarity between the usual coloured rays of light and those with which the photographer is, at present, obliged to work.

Sir W. J. Newton made a few remarks on the advantages which he stated were attendant in the use of alum as an adjunct to hyposulphite of soda, for fixing positives.

Thanks were voted to the authors of the papers read, and the proceedings then terminated.

On the table we noticed several beautiful specimens of Poitevin's photo-lithographic process. Some of these rival the photo-galvanographic process in fidelity and effect. No communication accompanied them. There were also a new form of collodion plate-holder and one of Wheatstone's small refracting prismatic stereoscopes with achromatic lenses, exhibited by F. Scott Archer, Esq.

Mr. Sims exhibited some specimens of photography on glazed porcelain slabs, both plain varnished, and coloured and burnt in.

THE ALBUMEN PROCESS.*

By Mr. Cash.

If there is anything original contained in this paper on the albumen process, I wish to state that it is the result of two persons having pursued the subject conjointly for the space of three or four years. And should Mr. Leece and myself produce anything in this paper which may be of use to the Manchester Photographic Society, they are heartily welcome to it. We will begin with the

PREPARATION OF THE ALBUMEN.

The albumen of the hen egg appears to us to be the best for the photographer, on account of its uniformity in thickness, and also for the simple reason that hen eggs are easier to be obtained than either duck or goose eggs. The albumen of the duck egg is, however, very clear and white.

The first step is to obtain some fresh eggs though there is such a thing as being too fresh, in which case the yolk is so tender that it is next to an impossibility to break them without mixing the yolk with the white, but they do very well after six or eight hours keeping. In cold weather, we have often taken good pictures after they have been kept a week.

In preparing the albumen we provide ourselves with a large basin, holding about one pint, and two clean vessels, one to hold the yolks, and the other the whites. Break the eggs very carefully, taking particular care not to mix any yolk, or germ, with the white, and then put into the basin the following formula :—

Albumen	3 ounces.
Iodide of Potassium	35 grains.
Lump Sugar	35 grains.
Water	½ ounce.

If the eggs are thin and poor do not add any water. Then with a silver fork, or a spoon, beat the whole into froth, until the basin is quite full and the froth so thick that the fork or spoon will stand upright in the center of the basin. The time it usually takes to get the albumen into that state is from fifteen to twenty-five minutes, constantly beating.

The basin containing the albumen is then laid aside, and covered over with a plate of glass, or a board, to keep the dust out, and the albumen allowed to settle down, which will take at least ten hours, when it may be poured into a bottle and corked up for use. Many operators use iodide of ammonium for iodizing their albumen; they give it the preference on account of the small holes iodide of potassium is said to make in the skies or black parts of the negative. The small holes are always present in negatives prepared with albumen iodized with iodide of potassium, but they do not often print on the paper. We have always been accustomed to use iodide of potassium from the belief that it is easier to be obtained good than the iodide of ammonium; but there is no doubt that the latter, if pure, is the best salt of the two. By putting bits of camphor into the bottle of prepared albumen it may be kept good for comparatively a long time. Last summer we took some good negatives with albumen which had been kept four weeks in this manner. Good glass is indispensable to the albumen process; patent plate seems to us to be the most suitable. It is easily cleaned in the following manner :—

A deal board and a hard nail brush and two perfectly clean cloths should be provided. The deal board should be considerably larger than the largest plate of glass employed. The glass is then laid on the board and brushed over with a moderately strong solution of ammonia or cyanide of potassium; the latter is very destructive to albumen film. Next rinse the glass under a running tap, then take off the superflous moisture with one cloth and dry and polish with the other.

To coat plates of glass with albumen the following articles must be provided, which are (with the exception of one) on the table for your inspection. The article not present is a small cast-iron stove, similar to those seen in almost every ironmonger's shop in town, having a round hole and a lid in the top. This hole is about five inches diameter in mine; and when there is a good fire, the heat striking upwards from it is very considerable. It has this advantage over a fire, that you escape having your plate in the current of air which forms the draft of the chimney, and which is loaded with smoke and dust.

The next important article is the albumen filter, a simple piece of apparatus formed out of a lipped measuring glass and a funnel. The latter should be long enough to reach to the bottom of the measuring glass, and a small piece of sponge put into the neck of the funnel completes the filter. The piece of sponge should be cut slightly conical, so that when pressed into the funnel, it will retain its position. It is perhaps needless to mention that this piece of sponge should be very fine, and kept scrupulously clean.

The bent piece of wire is for the purpose of holding and revolving the plates whilst they are drying over the stove. It may be made of either steel, iron, or brass wire, but which ever is used, it should possess sufficient elasticity to retain the glass plate by the corners between the two loops, in any position the operator may place it. A string is also to be tied to the wire, and by means of the sliding knot round, and the play of

* Read at the Meeting of the Manchester Photographic Society, December 3rd, 1856.

the corners of the glass plate in the wire loops, a level position may be attained. A boy's marble placed upon the plate, tests the position very nicely.

A brush to dust the plates, and a goose quill to distribute the albumen over them, completes the apparatus.

Having thus explained the use of the apparatus before us, we will accompany the photographer to his stove, which should have a bright and clear fire, and on a table close to the stove he should have the above mentioned apparatus, viz. :—a bottle of albumen, filter, piece of wire, brush, and a glass of clean water for containing and keeping clean the quill. We then place one of the clean plates in the wire and level it, brush off the dust, pour on some of the filtered albumen, distributing it over the plate with the quill, pour off the excess on to the sponge, and carry the plate to the stove in the wire, the albumen side downwards until you get there; then turn the plate, albumen side upwards, and begin to spin over the centre of the stove by the string attached to the wire. The string should always be slightly damped before spinning, as small particles are liable to fall on and spot the plate. The time taken to dry the albumen is usually about half a minute. The plate is then reared up in some warm corner of the room near the stove. In the operation just described, you wlll see that dust is a very great enemy, and that every precaution must be taken to prevent it falling on the plate. We would caution the operator where he will most likely meet with this pest, viz. :—the ceiling and walls of the room, and the clothes and hair of the operator, and nothing but a good brushing of these places, preparatory to the prepartion of a plate, will enable this operation to be successful.

EXCITING THE PLATE.

Before rendering our plate sensitive to light we must mention a fact that is perhaps not much noticed by albumen operators. The plate coated by iodized albumen is very deliquescent. When first brought from the stove, the film is quite hard and brittle when scratched with a hard point. If the same plate be allowed to cool in a moderately cool room it loses all the brittleness and become quite soft. Now the different degrees of hardness in the film influence to a great extent the working qualities and appearance of the plate after it has passed the exciting bath. We have brought for the inspection of the Society three plates which show the appearances alluded to. The first is a plate that has been put into the bath too soon and was evidently too hard for a uniform chemical action to take place. The second is a good plate, and the third is the inverse of the first, being put in after remaining too long in cooling; or the same effect would have been produced had it stood near a damp wall. In the latter case the chemical action has been too intense.

The albumen operator then requires some test to enable him to judge when to put his plate into the bath, and the only one we know is that of scratching the corner of the plate with the finger-nail, and if he can just scratch it, it is fit for the following exciting bath :—

Nitrate of Silver	70	grains.
Distilled Water.......................	1	ounce.
Glacial Acetic Acid	1½	drachms.

Though this bath is a strong and expensive one we would advise persons practising the albumen process, whether they make use of the vertical or horizontal dipping troughs, not to limit themselves to too small a quantity, as economy in this respect (as in many other branches of photography) is no economy at all in the long run.

We have always made use of the horizontal gutta-percha and porcelain trays for our exciting baths, and have experienced no difficulty in exciting plates in them, six or seven ounces of aceto-nitrate solution in the bath has proved sufficient to excite plates 10×8 inches, but as before mentioned we prefer to have a much larger quantity on hand in addition to that in the bath. Great care must be taken to avoid dust falling on the bath, as the dust floating on the surface of the solution marks the plate. The bath ought to be provided with a cover which should only be removed when there is a plate to be excited and replaced when the operation is performed.

The exciting of an albumenized plate in a horizontal bath might at first sight appear difficult, but it is not so, a little practice being all that is necessary to accomplish it with the greatest ease. Care must, however, be taken to allow the plate to fall on the surface of the solution with a progressive and uninterrupted motion, as any stoppage always produces a line or crack sufficiently substantial to print on the paper. Having been accustomed to work in a room of a warm and uniform temperature our time of leaving the plates on the exciting bath has usually been one minute, but the time varies according to the temperature.

The plates after leaving the exciting bath must be well washed in a bath of distilled, or filtered rain water, and then left to dry in the grooved plate box, which should have a piece of clean blotting paper at the bottom to absorb the water.

EXPOSURE.

Albumenized plates have obtained a reputation for their good keeping qualities; but though we can bear testimony to this fact, yet any party following the albumen process can hardly fail to notice that the loss of sensitiveness in his plates is in proportion to the length of time they are kept; our own experience is, that we have always obtained the best results when the exposure has been under the influences of a bright sun and the plates have not been kept more than two or three days. We have been accustomed to go out on a two or three days' tour with perhaps eight or nine plates in our plate box.

Our mode of changing the plates in the field from the plate box to slide, and vice versa, is as follows. We have a large bag that is just over the camera, in fact it is a case or cover for it; it is twice the length of the bottom board of the camera, is open at both ends, and is closed with a drawing tape. At the end of the bag at which the slide is introduced, are two sleeves, one at each side, made of the same material as the bag, which close and open for the admission of the hands by two elastic bands sewn in the ends.

The bag is made of one fold of thick black calico and lined with a yellow material on the inside.

The plate box now being inside the camera ;here it always remains (except when taking a icture), the slide is put in at the back, and he bag drawn up perfectly tight. The hands f the operator should then be introduced through he sleeves at the sides to open the back oard of the slide and lid of the plate box. 'he plate should then be taken out of the slide nd put into a groove of the plate box, the lbumen side upwards. Another plate should hen be taken from the box and put into the lide, the albumen side downwards. It is a ood plan before any plates are exposed, say efore leaving home, to place the plates so that hey will always have their albumen sides ownwards in the box, they being more easily ot into the slide. On the other hand, the exosed plates are best put with the albumen ide upwards, so that by touching you may be nabled to tell which have been exposed and hich have not. Care must be taken to have he plate box perfectly impervious to light hen brought out of the camera, during an xposure.

DEVELOPMENT.

We will now proceed to the development. 'he method which we consider best is as follows: ut the negative, that is to be, into a porcelain ray a little larger than the plate, pour on it bout ¼ inch deep of a saturated solution of allic acid, allow it to stand 15 minutes to often the film, then add aceto-nitrate solution, rop by drop, until it produces a slight milkiess. If the plate is a good one and the xposure correct, nothing more is necessary han to leave it there until it is developed, and s much half shade brought out as it will tand without endangering the transparency of he negative.

Warmth and pyrogallic acid may be made of se for negatives that have been under-exposed, ut if this can be avoided it is much better.

We have fixed all our negatives with a ioderately strong solution of hyposulphite of oda, and formerly were in the habit of bleach-ıg them with bichloride of mercury dissolved ı hydrochloric acid, and restoring them with he hyposulphite of soda solution. The latter iethod is quite unnecessary in good negatives, hich are certainly dense enough, as it renders hem still denser, and in some instances has poiled them.

With these remarks we conclude our paper n the Albumen process, and hope that in anwer to a wish expressed by some gentlemen resent at the last meeting, we have succeeded ı informing the Manchester Photographic ociety, as to our manner of manipulating.

We learn with pleasure that the council of Ling's College, taking into consideration the rowing importance of photography, and the emand that exists for instruction in its ractice and scientific theory, have determined o make it a branch of tuition in the College, nd have appointed Mr. Hardwich to the ffice of Lecturer on Photography in the)epartment of Applied Sciences.—*Journ. Phot. Soc., Dec.* 1856.

DR. HILL NORRIS'S GELATINE PROCESS.

In our number for September last we gave a process, by Dr. Hill Norris, for preserving the sensitiveness of collodion plates, by coating the surface with gelatine. A fuller account of his process is given in the Journal of the London Photographic Society, and as it is one which, slightly modified, is at present very much in vogue, both among our continental neighbours and at home, we give the following extracts from his paper:—

A very simple means is afforded of ascertaining if a given collodion be suitable for dry purposes. After removing the plate from the silver bath, pass the finger along it, pushing the film on before; if it be possible to draw the film back, or partially back, as a kind of skin, such collodion is quite unsuitable; but if the film in advance of the finger is in a powdery state, and cannot again be spread out, the collodion will be highly adapted to our purpose, as its porosity, admitting of the perfect penetration of the solution of gelatine, or other substance, affords an obstacle to the condensation of the film on drying.

Having procured a collodion containing the proper conditions of success, he proceeds to coat the plates in the ordinary manner, and immerse in a neutral solution of silver, the strength of which may vary from 30 to 40 grains of nitrate of silver to the ounce, and which should contain, unless the collodion is in the highest degree porous, at least one ounce of absolute alcohol to the pint. Dr. Norris finds that a contractile collodion may be made very short and porous by this addition, and as it is an alteration readily effected, it is frequently a most convenient method, but the condition of film induced is, nevertheless, not precisely analogous to that of old collodion. The plate having remained sufficiently long in the silver bath, is well drained and washed for five minutes or longer, under a tap of filtered water, back and front, to remove every trace of nitrate of silver.

Mr. Sutton, in the *Photographic Notes*, advises that attempts be made to retain as much as possible of the free nitrate of silver in the film, as tending to increase the sensitiveness. Dr. Norris, however, is satisfied that this is an erroneous view, and likely to prove very unsatisfactory in practice, as the plate will be liable to blacken all over, a very common occurrence when carelessly washed.

Draining the plate well from the water, it is now immersed in a solution of gelatine, composed as follows, for a period varying from 5 to 15 minutes:—

Gelatine (Nelson's patent)......	120 grains.
Distilled water......................	14 ounces.
Absolute alcohol	2 ounces.

It is sometimes necessary to vary the strength of the gelatine solution, occasionally using it as high as 10 grains or as low as 4 grains to the ounce; but I invariably find the collodion admitting the largest proportion of gelatine to give the most sensitive plates.

The solution of gelatine should be as brilliant as water. This is accomplished by adding to 16 ounces of the solution half a spoonful of albumen, shaking well together, and placing the bottle in a water bath, or by the side of a hot

fire. When it reaches the boiling point of alcohol the albumen will be coagulated, and the solution must then be filtered. It is very difficult to coagulate the albumen, if alcohol be absent.

The next important operation is that of drying the plates. They were formerly dried reared up before a hot fire, at the distance of about a yard, which was found very successful; but recently a box heated with hot air has been used, which, of course, is an improvement, being much cleaner. The temperature at which the drying should be conducted varies, according to the strength of the gelatine solution. A strong solution requires a higher temperature than a weak one, because its gelatinizing point is higher. As a general rule, the temperature should be about ten degrees higher than the gelatinizing point of the solution used.

The plates being dry may be used at once, or stowed away in a dark dry box till required. They will keep a great length of time, as the surface of the iodide is protected from atmospheric influences by a pellicle, or varnish of gelatine, and, being dry, they are not in a condition for chemical action, as is generally the case with moist preservative processes. At the end of six weeks no deterioration has been observed.

Whether or no dry plates will ever be obtained as *sensitive* as moist ones containing free nitrate of silver is at present an undecided point; but his process, Dr. Norris believes, approximates more nearly to this desideratum than any other, the exposure being at most but twice the amount required to produce a good negative by the ordinary wet process. Moreover, there is a great range allowed. He has taken two good negatives at the same time, under precisely the same conditions of light, giving one two and the other four minutes, the only difference being that the former was much longer in developing. From casual results obtained in the course of experiments, Dr. Norris entertains but little doubt that the dry processes will ultimately rival moist ones in their degree of sensitiveness.

The plates having been exposed, the development is very simple, and consists of flooding over them a saturated solution of gallic acid in water, to every ounce of which 10 minims of a 40 grain neutral solution of nitrate of silver have been added. The development usually occupies from two to four hours. After well washing, they are fixed in the usual way with weak cyanide of potassium, dried and varnished.

The following are a few sources of failure which, when the causes are known, are easily avoided:—

Blackening in circular patches.—These are black stains radiating from a centre, giving the idea that they are caused by the solutions being poured on at the spot. They entirely arise from chemically unclean plates, the gallo-nitrate of a former development remaining in the pores of the glass, and forming a centre of decomposition. The plates must be soaked in nitric acid, or strong solution of potash. The developing dishes should always be cleaned with fresh nitric acid before every batch of development, and if stains should arise upon them, it may be known that old gallo-nitrate is still in their pores.

Defective Developments: Blistering; Stripping up of Film.—The whole of these arise from the collodion employed being contractile, or non-porous.

Universal Blackening.—This is due to an imperfection in the drying, owing to the gelatine setting unequally upon the surface. This would never occur if the plates were dried more rapidly—say in a quarter of an hour.

Deposit over the whole Plate.—The result of inefficient exposure and prolonged development, which also occasions the yellowness of the shadows, when not due to the use of inferior gelatine.

In conclusion, Dr. Norris states that he is still investigating the changes which collodion undergoes, and he will at some future time lay before the society the result of his research in a more complete and elaborate form.

NEW DRY COLLODION PROCESS.

By M.M. Firmin and Lassimonne.

We extract the following dry collodion process from the "*Bulletin de la Société Française de Photographie.*" It seems to be characterized by more originality than we have lately seen shewn in these different modifications of our English processes.

The collodion is prepared from the following formula:—

Ether	600	parts.
Alcohol	400	"
Iodide of zinc	8	"
Bromide of Cadmium	3	"
Gun cotton	15	"

This is poured on the plate, and rendered sensitive in the usual way, in a bath containing from 20 to 25 grains of nitrate of silver to the ounce of water. It is to be carefully washed and then a mucilage of gelatine, prepared as follows, is poured over the surface:—Take

Water	1	quart.
Gelatine	$\frac{3}{4}$	oz.
The white of one egg.		

This latter is to be well beaten up, the froth allowed to settle, and then the liquid albumen added to the solution of gelatine. It is then to be boiled until the albumen is entirely coagulated, and, whilst still warm, filtered through bibulous paper: after the addition of 10 per cent. of solution of ammonia, it is ready for use. It must be slightly warmed before using to restore the fluidity, a small quantity poured on and off the collodion side of the plate; and this latter put by to drain in a box, taking care to place the sensitive side downwards in such a manner that it rests by means of one of the angles on a piece of blotting paper, and the upper opposite corner against the side, so that it is only supported by two points. This method of drying is indispensible for preserving the uniformity of the prepared surface.

The plate may be kept excited for more than a month; and as its sensitiveness is not very great, the time of exposure should not be too short.

After taking from the plate-holder, after exposure, the glass is to be completely immersed in a saturated aqueous solution of gallic acid and the action allowed to proceed for about a minute; the plate is then to be removed (t

avoid stains), and a few drops of the following solution added to the liquid.

REDUCING SOLUTION.

Water	....	100 parts.
Nitrate of silver	....	5 ,,
Sub-acetate of lead	....	5 ,,

The image now appears rapidly, and with a remarkable vigour and clearness. As soon as sufficiently developed, the process is completed by fixing in a saturated solution of hyposulphite of soda, and well washing.

This process possesses great certainty in execution, and a very great clearness; the sharpness of the lines rivals that of albumen, and the sensitive plates may be carried about, merely wrapped in paper, if kept in perfect darkness.

The above mode of developing may be equally well employed for developing moist collodion pictures. After exposure, the plate is to be immersed in a saturated solution of gallic acid, and at the end of a minute removed. A small quantity of the above reducing solution (nitrate of silver and sub-acetate of lead) are then to be added, upon which the picture will develope rapidly. The development must not be pushed too far, as the dark parts of the picture offer a great obstruction to the passage of light.

THE ORIGINAL INVENTION OF THE STEREOSCOPE.

The following is a continuation of the letters by Professor Wheatstone and Sir David Brewster to the Editor of *The Times*, respecting the original invention of the stereoscope:—

No. V.

To the Editor of " The Times."

SIR,—If you can spare me a few lines to correct some of Mr. Wheatstone's very incorrect statements, and also to add some new information on the history of the stereoscope, I shall not again trespass on your columns.

1. In his first letter in *The Times* Mr. Wheatstone refers to my correspondence with him in 1832, as proving that I then knew that he had invented the stereoscope. Knowing that I never heard of the stereoscope till 1838, I challenged him to publish the letter, or any part of it that mentioned the instrument. He has declined to do this, and has substituted a paragraph of his letter to me which neither alludes to the stereoscope nor anything that has the least resemblance to it. My answer to that letter, which I again call upon him to publish, could, therefore, contain nothing on the subject.

2. Mr. Wheatstone asserts that I announced, "that unless additional evidence were brought forward, I would continue to place Mr. Elliott's claim above his," and that I further required a proof that he had constructed a stereoscope at a particular time. I deny that I made any such announcement, or any such requisition; I consider Mr. Elliott as an independent inventor and constructor of the stereoscope. I believed, on the authority of his letters, that he had anticipated Mr. Wheatstone in the conception of the instrument, till I read the passage from Mayo, and I think your readers will share with me in the surprise that so remarkable an invention as the stereoscope, if actually constructed and exhibited in 1832, should have remained six years in Mr. Wheatstone's desk, and make its appearance before the public only in 1838!

3. In reference to the theory or explanation of stereoscopic phenomena which I published in 1843 in refutation of Mr. Wheatstone's views, I have only to state that it has remained for thirteen years unopposed by himself or any other person; that he had annual opportunities of discussing the question with me before distinguished members of the British Association; and that in 1852, when he was specially bound to defend himself, in his second paper on the stereoscope, in the *Philosophical Transactions* for that year, he was silent on the subject. In 1843 I demonstrated the laws of visible direction, visible position, and visible distance, and I assert that "by means of these laws all the phenomena of erect vision from an inverted image of the single vision of points, of the vision of plane surfaces and solids, and of the conversion of two plane pictures into solids or objects in relief, may be calculated with as much accuracy as we can compute the positions of the heavenly bodies" (*Life of Newton*, vol i., p. 235), and I challenge Mr. Wheatstone to discuss these or any other points to which he has referred in the philosophical journals of the day. I call upon him also to defend the method of taking binocular pictures which he has sanctioned, and which I have proved to be as erroneous in science as it is truthless in art.

4. I have stated, and Mr. Wheatstone denies, that Aguilonius and others anticipated him in the principle of the stereoscope. The principle of the stereoscope consists of two facts,—the one, that the pictures in each eye are dissimilar; and the other, that when two objects or points upon a plane surface are united by squinting, that is by looking at a point nearer the eyes, they are seen as one object or point at the place of convergence of the optic axes; or, to express it differently, that difference of distance from the eye, or relief, is obtained and measured by the different distances of objects or points united by squinting, or any other process. The first of these facts Mr. Wheatstone claimed as his own discovery; but I have proved, and he does not now deny it, that Aguilonius and others had anticipated him in this discovery. With respect to the second fact, it is distinctly established by Dr. Smith, of Cambridge, in his *Optics*. (Rem. vol. ii., p. 86, fig. 161.) He places two candles at the distance of two or three feet from the eyes, and after uniting them he sees a single candle nearer his eyes. If the two candles are made to approach one another, the single candle recedes from him, and if they are made to recede from one another, the single candle approaches to him. He makes the same experiment with the same result, with the points of a pair of compasses, thus demonstrating by direct experiment the second principle of the stereoscope, that the different distances of similar points in binocular pictures give, when united, different distances from the eye of relief. Dr. Smith (*Id.* vol. ii. sec. 977,) has proved the same thing, when the eyes are converged to a point beyond the points of the compasses, as in M. Faye's stereoscope. In place of taking compass points, Mr. Elliott took two moons at a certain distance from each other, and two crosses

at a different distance, and two spots of water at a third distance, and he united those, as Dr. Smith did, and thus saw the three objects in relief forming a rude landscape, decidedly the first landscape seen in relief by any stereoscope.

5. Another candidate for stereoscopic discovery, (or bathoscopic, as the author calls them, from βαθος depth), has appeared in Canada. In the *Toronto Times*, of October 8, sent me by Mr. George Maynard, he claims to be the first person who published anything on the peculiar phenomena of binocular vision and the principles of the stereoscope.

"In the year 1838," he says, ("If I mistake not) at a meeting of the British Association, the attention of philosophers on the continent of Europe was invited by Professor Wheatstone to some remarkable phenomena of vision with two eyes; and a small apparatus, the stereoscope, was presented in illustration of his experiments."

"It did so happen, however, that in the year 1836 (two years previous to the period afore-mentioned) a protracted article signed "Theophilus," and involving a detailed enunciation of binocular phenomena, with their bathoscopical results, was published by me in the *Royal Standard*, daily paper, at Toronto, and such is (in my opinion) the misapprehension generally existing on this interesting subject, that (even after twenty years of additional information) I am encouraged to hope that the remarks then published, with a little amplification, will not prove unacceptable to the generality of your readers."

Such is the commencement of a long and very interesting article, occupying a whole page of the newspaper, and shewing, if the paper by 'Theophilus' contains the same truths, that Mr. Maynard was, in 1836, possessed of the true principles of the stereoscope, and had produced relief by uniting objects at different distances on a plane surface. His observations on the vision of points are admirable, and in entire harmony with the views which I have published.

I am, Sir, your most obedient servant,

D. BREWSTER.

St. Leonard's College, St. Andrew's, Nov. 1, 1856.

No. VI.

To the Editor of "*The Times*."

SIR,—The following observations, in reply to Sir D. Brewster's third letter, will, I trust, close the discussion which he has opened in your columns:—

1. Sir D. Brewster, who, to distract attention from the real questions at issue, seems desirous to involve me in a contest of mere words, misrepresents what I said respecting our correspondence in 1832, when he asserts that I referred to his correspondence with me as proving that he then knew that I had "invented the stereoscope." What I actually stated in my first letter to *The Times* was, that I could "show from our correspondence that he was aware, so early as 1832, that at that time I was preparing for publication my memoir on the subject." In my second communication I justified this statement, by giving an extract from a letter sent by me to him, the receipt of which letter was acknowledged in a reply, dated November 3, 1832. In the passage quoted, I stated my intention of presenting to the Royal Society a paper "on binocular vision," in which I said "I shall describe a series of very curious optical illusions, which I believe to be perfectly original." The memoir thus announced to Sir David subsequently appeared in the *Philosophical Transactions of the Royal Society*, under the title, "On some remarkable and hitherto unobserved phenomena of binocular vision," and it contained a full description of the curious optical illusions exhibited by the stereoscope. Sir D. Brewster was therefore certainly aware, in 1832, that I was then preparing my memoir on the phenomena of binocular vision, however afterwards he might have forgotten the circumstance.

2. Notwithstanding Sir D. Brewster's denial of his requiring a proof that I had constructed a stereoscope in 1832, he still affects to doubt its existence at that time. "I think," says he, "your readers will share with me in the surprise that so remarkable an invention as the stereoscope, if actually constructed and exhibited in 1832, should have remained in Mr. Wheatstone's desk, and make its appearance before the public only in 1838!" If any justification of the delay in publishing my complete results, after I had announced the general facts, be necessary, it may be found in the following circumstances. Between the periods referred to, I published, in 1833, my memoir "on the figures of vibrating surfaces," and, in 1834, my memoir "on the velocity of electricity and the duration of electric light," which gained for me admission to the French Academy of Sciences; from 1834 to 1838 I was engrossingly engaged in those experiments relating to electrical phenomena to which my last investigations had led me, and from which resulted all my inventions connected with the electric telegraph. It is not much to be wondered at, that, during this interval I was obliged to defer to a future time the consideration of subjects of less immediate interest, some of which I have not even yet had the opportunity of resuming.

3. I have hitherto avoided entangling myself in the meshes of controversy with so disputatious an antagonist as Sir D. Brewster. I have always thought myself more usefully employed in investigating new facts, than in contending respecting errors which time will inevitably correct. I deny Sir David's right to challenge me to a combative discussion; but since nothing else will satisfy him, I accept his defiance, and will undertake to point out in the pages of the *Philosophical Magazine*, the numerous misapprehensions and misrepresentations he has made with regard to my researches on the subject of binocular vision, and the errors into which, I conceive, he has him self fallen.

I was far from thinking, when answering an anonymous letter in the columns of *The Times*, that it had emanated from the same source from which had proceeded all the attacks which have, with reference to this matter, during the last four years been directed against me; but I cannot regret the opportunity which that circumstanee has afforded me to correct, in the most efficacious manner, a few of the most prominent of the mis-statements made. I have limited my replies to those points only which Sir David has brought forward on the present occasion; others of equal importance, remain to be eonsidered elsewhere.

4. Sir D. Brewster still insists that Aguilonius and others have anticipated me in the principle

of the stereoscope. None of the particular facts which Sir David has brought forward, constitute, either taken by themselves or together, the principle of this invention, which I maintain to be what I stated in my last letter. No invention ever has been made, nor any invention ever will be made, with respect to which something involved in it has not been said or done previously; but it is uncandid to allege that such or such a thing is the principle of a discovery, leaving out of consideration those superadded ideas which, in combination with what has been previously known, constitute its originality.

But even with regard to the fact that when an object of three dimensions is viewed while the optic axes converge, two obviously dissimilar pictures are projected on the two retinæ, however strange it may now appear that it should ever have been overlooked, I have not yet been able to find a distinct enunciation of it in any author before the date of my first memoir. Euclid, and the subsequent writers alluded to by Sir D. Brewster, merely show that when a solid body, as a sphere or a cylinder, is seen with both eyes, under certain circumstances, a little more of its right side is seen by the right eye, and a little more of its left side by the left eye.

Sir D. Brewster, indeed, endeavours to prove that Aguilonius was perfectly acquainted with the fact that dissimilar pictures or perspective projections of an object are seen by the two eyes; but he completely misrepresents what this author says. In the chapter alluded to by Sir David in his second letter, and more fully referred to in his work on the stereoscope, (pp. 11-13,) the purpose of Aguilonius is to show that when the optic axes are directed towards an object obliquely, the visual rays proceeding from the object to the centres of the eyes, make, in consequence of the unequal length of the axes, a greater angle to one eye than they do to the other, so that the object is seen of a different magnitude by each eye; and he endeavours to explain the cause of distinct single vision in the case of the dissimilar magnitude to each eye of an object, when viewed obliquely, by assuming a corrective power to exist in the mind. Aguilonius does not in any way refer to dissimilar figures, and he expressly says that in the direct view—that is, when the eyes look immediately forward, and the optic axes are equal in length—the optical pyramids formed by the visual rays are similar.

Sir D. Brewster's assertions that Aguilonius in this chapter was treating of "the union of dissimilar pictures in each eye by which a solid body is seen," and was endeavouring to explain "why two dissimilar pictures of a solid, seen by each eye, do not, when united, give a confused and imperfect view of it," are therefore quite erroneous. The passages, even as quoted by Sir David Brewster, would be alone sufficient to show this; but he has rendered them unintelligible by interpolating references to a diagram which the author does not give, and which is incompatible with his text. Besides this, Sir David misleads the reader by stating that the passages he quotes occur in the first (second) book of the learned Jesuit's work "where he is treating of the vision of solids of all forms (*de genere illorum quæ τὰ στέρεα nuncupantur*)." Now the title of the book is *De Radio Optico et Horoptere*, and it does not in any part treat of the subject Sir David names; the sentence above quoted only incidentally occurs in the course of a proposition, and *τὰ στέρεα*, instead of signifying solid bodies, means, as Aguilonius himself explains, certain hypothetical forms, which he elsewhere calls optical pyramids, having the vertices of their angles in the eye, and their bases on the surfaces of the objects; and he further says that this form *(corporea forma)* is a cone when the base is a circle, and a pyramid when the base is a triangle, a square, or a polygon.

It is evident that Sir David has looked upon Aguilonius through a pseudoscope.

5. With reference to the new candidate whom Sir D. Brewster has brought forward, it is sufficient to observe that the date given is three years subsequent to the public announcement of my discovery. There is nothing in the article in the *Toronto Times* which enables me to distinguish what the author now additionally puts forward from what he originally published. But still I can see nothing in the experiments related, which is not to be found in the works of Bishop Berkeley and Dr. Smith, who both wrote more than a century ago. But since the Canadian author makes no allusion to the facts and conclusions of these eminent writers, he must, I suppose, according to the law which Sir D. Brewster would enforce, be considered, "in the history of science," as their independent discoverer.

I am, Sir, your obedient servant,

C. WHEATSTONE.

Athenæum, Nov. 11, 1856.

Mr. Newton, our Vice-consul at the beautiful island of Cos, in the Greek Archipelago, has lately had the good fortune to make a no less noble discovery than a buried Greek city. The admiralty, immediately on the receipt of the news, with honourable promptitude, sent out in the Gorgon, steam-frigate, a complete set of photographic apparatus and chemicals, together with the materials required for excavations. We may therefore look forward shortly to having brought home to our firesides, photographic pictures of those priceless treasures which our learned and indefatigable Vice-consul will doubtless rescue from the fate which too often awaits such relics of antiquity.

ANSWERS TO CORRESPONDENTS.—Want of space compels us to defer these till next number.

CONTENTS.

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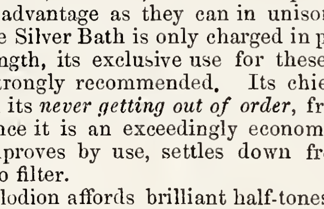

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

EDITED BY WM. CROOKES, ESQ., 15, STANLEY-ST., BROMPTON, LONDON, S.W.

Published on the 1st and 15th of each Month.

NEW SERIES.] No. 3.—FEBRUARY 1, 1857. [Price 3d. Stamped 4d.

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 3.—FEBRUARY 1, 1857.

r seldom falls to the lot of any journalist to mounce a discovery which promises such im- ortant results as the one which now appears ι our columns. Nearly fifteen years ago it as announced by Professor Moser, of Konigs- erg, that many bodies had the power of leaving ıvisible impressions of themselves on smooth ırfaces with which they had been for some me in contact, even in darkness; which nages could be rendered visible by breathing pon them.* Attempts, which were partially ıccessful, were afterwards made by Mr. Hunt,) obtain more permanent impressions by em- loying the vapour of mercury or iodine instead f the breath; and as it was thought that heat layed an active part in producing the effects, e proposed that the name of *Thermography* ıould be given to these phenomena. Here all ue to further examination seemed to be lost: ıany an investigating mind had been from me to time turned to the subject, but without iscovering anything of importance, until re- ently Mr. W. R. Grove, our world-renowned hysicist, stepped in, and by a series of ad- ıirably-devised experiments, has brought all ıe hitherto inexplicable phenomena into rela- on with electrical and other sciences. His xperiments in detail are given in the *Philoso- hical Transactions;* and although of the highest ıterest and importance, would occupy too ıuch of our space. The abstract which appears ı our columns is quoted from that well-known eriodical, *Chambers' Journal*, for which it has een prepared by a gentleman of high scientific tanding. The concluding paragraph cannot ıil to be of special interest to photographers, pening as it does an almost boundless field of nquiry, and bidding fair to rival in practical nportance the very discovery of photography self.

For some time previous to the eclipse of the ıoon, which took place on the night of October 3th, 1856, great preparations were being made t the establishment of M. Porro, the celebrated ptician and instrument maker, at Paris, in rder to obtain, if possible, a series of photo- raphic images of our satellite during her passage through the earth's shadow. His monster object-glass, upwards of twenty inches in diameter and forty-nine feet focal length, the largest and best of its kind that has yet been produced in France, was dedicated to this purpose. Owing to the imperfect mechanism which was used to keep the sensitive plate following the image of the moon, the results are not quite so sharp as could be desired; and although of the highest interest and importance, when the rare occurrence which they record is considered, they are not to be compared with the wonderful lunar maps photographed in this country. MM. Bertsch and Arnauld have recently presented to the Photographic Society of France a memoir on the subject, which we have not hesitated to insert in full, feeling assured that our readers will peruse it with as much interest as we ourselves did.

In our last number we instituted some comparisons between the catalogues of the London, Manchester, and Edinburgh Photographic Exhibitions, very much, we are sorry to say, to the discredit of the parent society; turn we now from the catalogues themselves to the contents of the respective exhibitions whose representatives they are, and here some curious differences occur. Arranging their contents in a tabular form, and supposing the number of pictures* to be the same in each, viz., 1000, we have the following result:—

	Collodion	Waxed Paper.	Calotype	Albumen.	Miscellaneous Dry Collodion Processes, &c.	Portraits.
London......	825	66	41	8	60	170
Manchester..	649	200	111	30	10	87
Edinburgh...	600	51	232	70	47	280

Several of these numbers, it is true, must be modified before any accurate comparisons can be drawn between them. For instance—in portraits, those in the London exhibition consist chiefly of well-known persons, and thus possess general interest; while in Edinburgh, with a few solitary exceptions, they are likenesses of the private friends of the exhibitors, and so of no public interest whatever. In the Manchester exhibition also very many of the collodion pictures are by foreign artists; but these only serve to render the differences still more striking. Whence is it that our Manchester photographers have such a large preponderance of waxed paper pictures, outnumbering London upwards of three, and Edinburgh nearly four

* The following simple experiment, which can be tried by ıy one, will show the nature of these curious impressions:— ut any design or word through a piece of card, and lay this ı any smooth polished surface, such as a looking-glass or ble; then breathe on the figure with a sharp quick move- ent, and at once carefully remove the card, without however ıbbing the surface; the moisture from the breath will be seen ıickly evaporating, and soon the polish will be as undimmed at first. Now, by quickly breathing over the place, the figure ill instantly start into existence, black on a white ground, ith an accuracy truly remarkable. For hours afterwards the mooth surface retains the latent impression, which can at will e called into existence by the action of the breath.—Ed. . & M. P. J.

* In reality they are—London, 726; Manchester, 681; Edinburgh, 875.

times? In calotype, too, Edinburgh has almost six times the proportion of London, and double that of Manchester; while in the albumen process the numbers show still greater dissimilarity. What a strange, yet interesting train of thought is suggested by the above! —a particular process, from accidental, local, or, perhaps even geographical causes, becoming as it were rooted to one spot. Is it that among our grander, more mountainous north country scenery, photography demands of the artist such long and laborious excursions, that collodion is inapplicable for the purpose, and thus recourse must be had to more manageable processes? There must be some cause, other than accident, for these remarkable discrepancies.

We have been favoured by Professor Maskelyne with a full account of the prepared plate box exhibited by him at the meeting of the Photographic Society of London, January 8th, 1857. We have great pleasure in inserting his description in our columns, and trust that the clear and lucid manner in which it is written will render any diagrams unnecessary.

THE RECENT ECLIPSE OF THE MOON.

Lunar Photography:

By M. M. Bertsch and Arnauld.

The following is the account given by M.M. Bertsch and Arnauld of their recent experiments in Lunar Photography:—

The object glass of 20 inches in diameter and 49 feet focus, by which the lunar image was formed, was mounted equatorially in a garden, and moved on a cast iron platform, supported by masonry of the most solid kind. The glass, which had not, however, received the last touch from M. Porro, was nevertheless perfectly achromatic, of a very fair polish, and gave a tolerably sharp image. The sensitive plate was kept at the focus in a holder which moves on four rollers, running along two grooves in the plane of motion of the image. This arrangement was drawn along, so as to exactly follow this movement, by a clock, the rate of which should, of course, be perfectly uniform and isochronous for at least 10 seconds.

M. Porro, was doubtful whether, with such a focal length as 49 feet, so feeble a light as that of the moon, diffused over an area of nearly six inches diameter, could impress our sensitive surface strong enough to give a negative in a sufficiently short time. Consequently he was unwilling either to go to the expense of clockwork movement which should answer all the desired purposes, or arrange the plate-holder as it ought to have been, not on a framework of wood, but on metallic grooves fixed to the stage, and by which means the jerking movement would have been avoided.

The motive power used in this preliminary experiment was one of an old construction, governed by the usual fan regulator, and the fusee of which was not in proper proportion to the length of the spring. As the plate could only be moved along by irregular jolts, we were unable, even in ten seconds, to obtain anything but a series of superimposed images, a little way out of the line of the moon's motion, and consequently indistinct. On on of our pictures can be seen as many as si images, one over the other at extremely minut distances apart.

In spite of these serious drawbacks to th sharpness of the image, the experiment has, w affirm, completely succeeded. In a photographi point of view, although the motion of th plate across the field only allowed the centr rays to act during a very short time, our trial have given us perfect negatives. During th continuance of the eclipse we took three pic tures, one in 10, another in 15, and the third in 2 seconds. All three were successful, and are goo negatives, although developed with pyrogalli acid alone, without employing any of the accel rating agents which science places at ou disposal. The mechanical imperfections whic we were unable to overcome, must be remem bered; neither the object glass nor plate-hold moving smoothly, but by jolts, and thus causin dust to be raised, some of which has fallen o the sensitive surface and given rise to stain Allowance will also be made for a temporar location in a garden in the middle of the nigh and at a season when the damp made us unab to clean the glasses perfectly.

If these several causes have made us unab to present to you perfect impressions, and suc as we may certainly hope to obtain under bett circumstances, this experiment at least prov that, with moist collodion, by approaching its combinations the limit which separat spontaneous reduction from that brought abo by light alone, such an extraordinary sens tiveness can be obtained to so feeble a light that of the moon as to give a negative suf ciently intense for printing any number of go positives.

Our first picture, taken at 10h. 1′ 20″, an only being exposed 20 seconds, is consequent the least indistinct; the next, taken at 11h. 30″, was exposed 15 seconds, but the groov not being parallel to the motion of the moo the image is drawn out, as it were, which mak it altogether confused. The third was tak at 0h. 41′ 5″, that is to say at the time when t moon had left the earth's shadow, and sho this interesting fact that the portion of t moon which was still enveloped in the penu bra, reflected no chemical rays, although could only detect a diminution of about or tenth in intensity.

We have, in conclusion, to thank M. Po for the kindness with which he has assisted and the readiness with which he has modif his apparatus to suit the requirements of pho graphy. It will be learned with pleasure, t assured by this preliminary experiment of power of the means employed, he intends construct machinery capable of producing uniform movement, and to place his beauti object-glass in such favourable circumstan as shall ensure complete success.

We see from an abstract of a letter from G. P. Bond, of Harvard Observatory, Cambrid U.S., dated Nov. 7, 1856, given in the *Mont Notices of the Royal Astronomical Society*, t they are preparing, on a large scale, for ren ing experiments in lunar photography.

.IVERPOOL PHOTOGRAPHIC SOCIETY.

'HE second meeting of the session was held at he Royal Institution, Colquitt-street, on Tues-lay evening, January 20th: Mr. COREY, one of he vice-presidents, in the chair.

The new members having been proposed, the hairman remarked that the address which he ad prepared for delivery at the meeting of the th instant (the first of the session), had been vithheld owing to his illness and consequent bsence, and briefly alluded to one or two sug-estions it contained as worth the notice of the ociety. Beyond the time-honoured observance f the custom that the President *pro tem.* should ddress the members on the progress and inter-sts of the Society, it was eminently desirable hat their failures and successes, as well as their eneral achievements, should be reviewed, to uide them in similar difficulties should they gain occur, and to reanimate them to renewed rdour. He then suggested that with a view o the correction and prevention of errors, a etailed report of the preceding meeting should e read at each meeting of the Society. This e considered desirable, as affording each mem-er the opportunity of correcting what he night have stated hurriedly or imperfectly on previous evening. After some discussion it vas resolved that the Secretary be requested to ead at each meeting the report of the proceed-igs as printed in the *Liverpool and Manchester Photographic Journal.*

The letter of condolence with Lord Ellesmere, atron of the society, forwarded on behalf of he members, to his son, Lord Brackley, expres-ing the deep regret of the Society at the severe nd dangerous illness of the noble Earl, was hen read, together with Lord Brackley's reply.

Mr. BELL having been requested to give ome information respecting the Manchester Exhibition, which he had that day visited, stated hat he considered it well worth inspection; ts staple interest, as might be expected, was iot confined to pictures of local production, hough it contained many of considerable excel-ence produced in the vicinity. He alluded to he numerically large proportion of prints from vax paper and calotype negatives relatively to hose from collodion (those of Bisson Freres not eing considered), as remarkable, and as con-rasting with that of the London Exhibition, in vhich the entire preponderance seemed in favour f collodion, and expressed an opinion that some f the finest prints were produced from paper egatives. The majority of the prints had been nade in the direct manner, a small proportion nly by Mr. Sutton's or Sir W. J. Newton's pro-ess; but in instances where the same negative ad been printed in both methods, the results ppeared to offer no very marked difference.

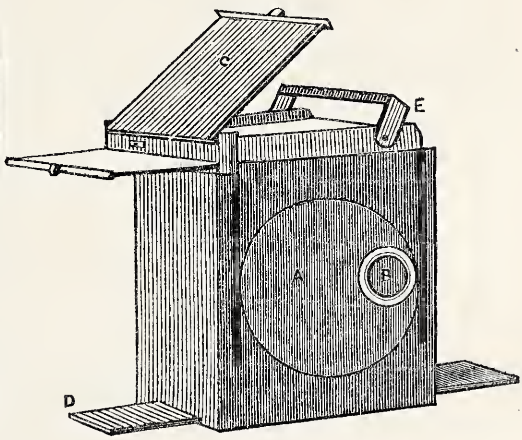
The CHAIRMAN then exhibited some experi-nental pictures by the oxymel and gelatine rocesses, observing that Mr. Berry and himself ad been investigating the relative excellences f oxymel, gelatine, and dextrine, but that Mr. Berry's time having been engrossed by other nvestigations, he had not been able to complete is series of experiments.

The gelatine negative was by far the more rilliant and effective, but appeared if any thing too intense, and likely to print with in-sufficient half tone. The oxymel negative how-ever was taken in a high wind, and the Chair-man thought it probable that but for this circumstance the oxymel negative would have printed as well as the gelatine, perhaps better; the time of exposure in each case was the same.

Mr. Montagu Marriott's stereoscopic camera, for the production of two stereoscopic slides, or four distinct pictures on one glass, was then exhibited, and attracted considerable attention by its ingenious and elegant construction, as well as portability, gained without sacrifice of firm-ness or stability.

We annex drawings—No. 1, of the front of the camera; No. 2, of the back; shewing the interior division of the body of the camera into cells, by vertical partitions intersected at right angles in the centre.

No. 1.



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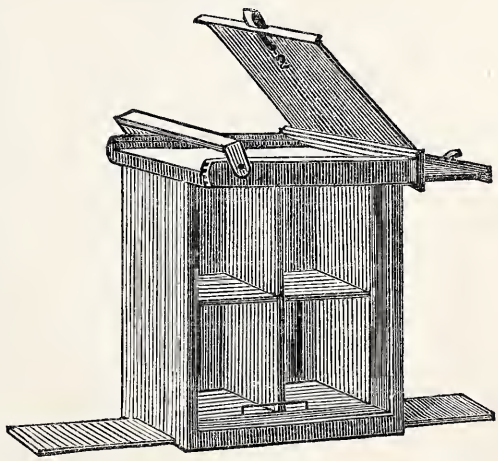

A, moveable disc; B, lens; C, camera frame, shewing flexile arrangement to secure prepared collodion glasses, and clamp the frame when fitted; D, graduated slide.

The loose piece which covers the top of the camera when the slide is put in, is, when packed, slid into the groove at the bottom, in place of the bar, for greater portability.

Mr. Marriott proposes the use of dry collodion, and the camera appears constructed with a view to its use, as the arrangement of the slides would scarcely answer for collodion in a moist state.

Its advantages, however, which may be adopted in any process, or to almost any camera, appear to be—1st, The use of the revolving disc A, by means of which the lens is brought literally in rotation in front of each compartment marked in drawing No. 2, in the body of the camera. 2nd, The ingenious contrivance to save space, in order that the frames may pack in the body of the camera. This consists of a flexible hinge placed about an inch from the bottom of the dark slide, the frame being divided at this point, by which plan the thickness of two extra doors to the frames is saved. In the ordinary slides made to hold two prepared glasses, the plates are put in from behind, and have a door at the back of each to secure them in their place, the slide being hinged so as to close with the two faces outward, which are successively exposed. In the slide E, it will be seen that the bottom of the frame falls back on an hinge, and the two plates are then pushed in from the bottom as they would be into an ordinary plate box; when inserted the bottom is brought back and secured by a simple fastening. The plates are, of course, back to back, and exposed successively as in the ordinary frame.

Several additional advantages are secured by this camera, among which may be enumerated the saving of time and lessening of risk of failure or accidental injury, two slides being taken with the same trouble as one; its extreme portability also cannot be too highly commended; nor the simplicity of contrivance which secures the use of four lenses at the expense of one. The lens employed by Mr. Marriott was a small "Ross," the same as those usually sold for stereoscopic purposes, and Mr. Foard spoke to the great excellence and brilliant sharpness of these lenses, Mr. Keith corroborating his statement.

Mr. DOYLE then read a paper "*On a new plan for a Stereoscopic Camera Table.*"

Mr. DOYLE commenced by remarking that stereoscopic pictures taken by one camera, when that camera was moved in a straight line were usually incorrect; and that it was to avoid this imperfection by securing a proper convergence of angle, so that the line reflected from the object should be at right angles to the ground glass, that his plan had been designed. The remedy proposed was to insert a joint, as in a two foot rule, in the centre of the straight rod at present in use, on which the camera slides; by this means any angle of convergence might be obtained, which for convenience sake might be registered on each side, the two sides in inches to correspond, so that the same angle might be obtained on either side.

Mr. COOKE corroborated Mr. Doyle's experience as to the necessity for a slight convergence of the lenses in the production of stereoscopic pictures, and remarked that pictures taken by a camera moved in a straight line presented a small portion on each side which was not stereoscopic.

Mr. BERRY could not admit that the cause of the edges not being stereoscopic was the one Mr. Cooke had named, but thought it might proceed from the fact that one camera took in some object which did not fall within the range of the other, and of which there could be but one image, and, therefore, not stereoscopic; or in figures sometimes it happened from one figure moving.

An animated discussion here ensued, after which Mr. Berry gave some lengthy remarks on the relative keeping properties of collodion, waxed paper, and calotype, which will be read as a paper, in a more expanded form, at the next meeting of the Society.

MANCHESTER PHOTOGRAPHIC SOCIETY.

THE following is a list of the most important pictures on view at the Exhibition of the above Society, as referred to by the Rev. W. J. Read, M.A., F.R.A.S., in his paper entitled "*Visits to the Society's Collection of Photographs now exhibiting at the Mechanics' Institution,*" read before the members at their monthly meeting, on the 7th ult., the first portion of which was given in our last number:—

In No. 6. *Place Napoleon, Louvre, Paris*, by H White—we have an interesting example of the record of a transient scene: now that the additions to the Louvre are completed, and the scaffolding removed, it would be impossible to reproduce this very lively picture.

8. *A Shady Pool*, H. White,—is one of the best of its class, and in the middle distance of No. 12 ar effects deserving close examination both fro photographer and painter.

13. *Cottages and Figures*, H. White,—is peculiarl bright and sunny.

The pictures numbered from 32 to 37 are amon the most interesting in the Exhibition to photo graphers, being examples of Mr. Barnes's ne method of using dry collodion. They are certainl very satisfactory specimens of what may be do by it. The *View from Richmond* and *Pope's Vil* being the very finest in the room. This proce commends itself to us by the promise of quickne combined with simplicity, the chief drawbacks bei the necessity of grinding or roughening the surfa of the glass for some little distance all round t edges. If this be done with fluoric acid there wi be little if any difficulty other than is found in t ordinary collodion process.

In 39 we have a capital study of *Clouds*, whi may well be compared with several pictures which the skies have been painted in, and wi others which have been printed from more than o negative.

49. *Wharfedale*, by Mr. Roger Fenton,—is, I fe from its position, often overlooked, whereas it is o of the very finest photographs ever taken.

58. *William Etty*, a portrait, deserves attention a spirited portrait of a great man. An engravi has been taken from it upon wood and prefixed Mr. Etty's autobiographic sketch of his career, pu lished in the *Art-Journal.*

73. *Porte San Sebastiano, at Rome*, the small pict at your right hand on entering the room, has peculiar charm of softness and delicacy, and is v unlike, in tone and general appearance, to the earl photographs.

84. *Snow Storm, Paris*, is a bold and most eff tive attempt in a direction not often essayed. T atmospheric effect just preceding a heavy fall snow has perhaps never been so truthfully depic as here. A photographer misses much who fails see this picture.

Messrs. Cundall, Howlett, and Delamotte exhi a very pleasing series of pictures, numbered coll tively 93. How useful to an artist such a study that they call *Some pleasing page.* How beautifu do those *Jersey Rocks* stand out as if in relief; a again, how exquisitely are the trees and pla

rendered in the last of the series, the *Lake in Wales*. This set of pictures well displays the high capabilities of artistic excellence which belong to the old calotype process.

94—117. Mr. Mayall exhibits here a frame of twenty-four very striking portraits. They can hardly be claimed by photography as her own productions, many even of the uncoloured ones bearing evident marks of the stippling brush; but they are certainly remarkable examples of successful portraiture. It may be a comfort to many a puzzled sitter to perceive that Lord Palmerston has been at a loss to know what to do with his hands. The most characteristic and best of the series are perhaps those of Mr. Tennyson, Mr. Sims Reeves, and Mr. Albert Smith.

For some capital examples of untouched portraits we turn with pleasure to Nos. 123, 124, 125, and 126, by Mr. Alfred Brothers, which we should have been glad to have compared with Mr. Mayall's before painting. In one of these we recognise the Secretary of the Society.

131, is an excellent reproduction of David's great picture, *Ney's Retreat from Moscow*, though our proof shews indications of rapid fading.

135—152, *Studies of Flowers*, are beautiful representations of a kind in which Mons. Braun stands unrivalled. The picture of grapes, 147, is perhaps the finest, shewing as it does, the bloom upon the fruit along with its delicate opaline semi-transparency. M. Braun has been elected as honorary member of our Society.

153—160. *Burnham Beeches, &c.* Here we have another series of calotype pictures, by Sir William Newton, late President of the London Photographic Society. His object in these pictures has evidently been to use them merely as sketches, for they are quite short of the usual brightness of calotype. Some of this deficiency may perhaps be attributed to the manner in which they are printed, namely, by development. One of the series, I may add, has to myself a peculiar interest, inasmuch as it delineates, however indistinctly, a scene long familiar and for ever endeared to me.

May I here digress a moment to remark upon the strange familiarity with which a place greets you, even upon a first visit, after you have made acquaintance with its photographic representation. I was much struck with this when visiting the other day a place the topography of which I had learned only from a few photographs; and many, I dare say, have experienced the same kind of wonder that I did on finding an old friend when I expected a new one.

174. *Edinburgh, from the Calton Hill*, is a highly interesting and beautiful picture, difficult of management, but altogether successful. Every feature of the scene, yet unobscured by smoke, reveals itself in exquisite perfection, and you almost listen, as you examine the picture, for the busy hum of life to awake upon your ear from the thousands sleeping there.

The pictures, 178—186, upon the opposite screen, contributed by Mr. Sutton, but not marked as having been taken by him, afford good means of comparing the several processes to which they are due. Much praise must certainly be given to the printing of these, even though they do not quite endure very close inspection, which discovers the distances in some to be of a very mealy and uneven texture.

188. *Sea and Clouds*, which a careless eye may easily pass over as a strange picture, will be found well to reward a closer inspection. Look carefully into it and you will be surprised to find there the very glitter of rippling water.

195. Three large pictures joined together, and so glazed with gelatine that it is difficult to see them distinctly, give a painful impression of the desolation of the Glaciers, without their vastness.

198. *Zion sur la Rhone*, is perhaps the best result achieved by the albumen process. It is coldly toned and very highly glazed, but very exquisite in complete rendering of far off detail, and with more of atmospheric distance than such pictures generally have.

Among Mr. Sedgefield's series, published some time ago, but less known in this neighbourhood than they deserve, are many beauties. Look, for instance at 217, *Salisbury Cathedral*, and 218, *Salisbury Cathedral Cloisters*.

In 224 and 225, *Photographic Memoranda*, Henry Taylor,—we have the botanist at work with a pencil more subtle and more elaborate than ever before illustrated his science.

The next picture, 226, *Pyrenees*, is one which it is difficult to leave after once catching sight of the weary length of the winding pass and the pure distant snows.

From 229 to 257 we have a series of photographic copies of drawings, *Siege of Sevastopol*, exhibited by Bisson Freres.

(To be concluded in our next.)

Manchester Literary and Philosophical Society.—At a meeting of this society, held on Tuesday evening, the 13th ult., Dr. Smith, one of the secretaries, announced, among other donations, that of a portrait of the President of the Society, William Fairbairn, Esq., C.E., presented by the Photographic Society, of which he is one of the vice-presidents. Mr. Fairbairn occupied the chair, and acknowledged the unexpected honour done him by this presentation. The portrait is a very excellent one, and will be valued, we doubt not, by all who are interested in mechanical engineering, which has so much profited by Mr. Fairbairn's energy and skill. Mr. Fairbairn is a Chevalier of the Legion of Honour, and has recently been elected a corresponding member of the Academy of Turin.

PREPARED PLATE BOX.

By N. S. Maskelyne, Esq.

This box has for its object the retaining in a portable form, and in a state fit for immediate use, a series of prepared glass plates, on which a sensitive surface has been formed, with permanent sensibility to rays of light, whether by the collodion-oxymel, by the albumen, or by any other process. It consists of four sides, which are fixed, and a top and bottom formed by moveable shutters, like those of a camera slide. Within the box is a simple mechanism for holding any number of glass plates, separate one from another, and for causing these all to move simultaneously when the mechanism is set in motion, so as to permit every glass to fall through a small space, and to allow the bottom glass of all to fall into a camera slide, placed below the box to receive it. This mechanism consists of four small cylindrical barrels let into the woodwork of two opposite sides of the box, two barrels in each side. The barrels are placed vertically in the side of the box, and each barrel carries on it two series of boxwood or ivory pegs, fixed horizontally into the barrels, so that series 1 consists of as many pegs, *a b c* and *d*, placed vertically one over the other, as the number of prepared glasses which the box is to hold, and at twice the distance from each other that the glasses are to be allowed to fall at each motion of the machine. Series 2 of pegs is pre-

cisely identical with the former described series 1, but placed on the barrel in a plane at an angle rather less than a right-angle (say about 75° or 80°) to the plane which would pass through series 1 of pegs and the axis of the barrel. The pegs of series 2 are placed at points of the barrel exactly intermediate in distance from the top or bottom, to those occupied by the pegs of series 1. The result of this arrangement will be, that if a glass rests on the top pegs (pegs *a* of series 1) of all four barrels, and these barrels be made to revolve, each on its axis, through 80°, in such a direction as will bring the second series of pegs into the position previously occupied by the former series,—the glass will fall as the first series of pegs is withdrawn from the support of it, but it will alight on the highest pegs of the second series (pegs *a* of series 2). When the barrels are again made to revolve back into their former position, the glass will be dropped another stage, and will be found on the next lower pegs (pegs *b*) of the first series. Thus, by making all the four barrels simultaneously revolve through this small arc, first in one direction and then back in the other direction into their former position, one, or two, or as many glasses as there are pegs in each series on the barrels, may be made to drop through a small space, vertically, and may, by successive stages, after being introduced at the top, be made to descend to the bottom, and so into a camera slide, if one be placed below the last set of pegs, and be open to receive the glass as it falls.

This is simply effected. The barrels are all worked by little levers in a slide, so that a push forward and a pull back of this slide enables every glass in the box to descend one stage, (consisting, of course, of two steps, viz., from peg *a* of series 1 to peg *a* of series 2, and from peg *a* of series 2 back to peg *b* of series 1). For use, the box is charged full, say with twelve glasses, and a thirteenth glass may be placed in the camera-frame, which has a sliding shutter back. This frame is used to take the first picture; it is then slid into its place at the top of the box, *back downwards.* The shutter of the top of the box is drawn out—then the shutter of the slide. The shutters are replaced and the slide withdrawn; the glass in the slide has dropped, *face upwards* on the pegs *a* of series 1. The slide is now put into its place *below* the box, *back upwards:* the shutters are withdrawn as before, and the rollers are now worked once forward and once backward. The result is that simultaneously every glass in the box falls one grade: the bottom glass falls into the open frame, while the top glass on which the picture was taken has now fallen on to the pegs *b* of series 1, in each barrel, a place of security. It need not be said that the shutters of box and slide have only to be closed, the latter withdrawn and used in the camera, and the process repeated twelve times to enable the operator to carry away thirteen pictures which only require development.

It only remains to add that there is another pair of barrels worked by a separate motion, with small pegs to come *over the tops* of the glasses just as the pegs of the other four barrels are *under* the glasses, in order to retain the glasses in place, when the box is being carried by a handle in one of its sides.

The pegs are all cut away so that only the *edges* of the glasses touch them, otherwise they would abrade and tear the collodion (or other) film.

If it be needed to take smaller pictures than those for which the camera and its slide are constructed, frames may be made to hold the glasses of the size required, the periphery dimensions of which frames are those of the size for which the box is constructed: the one exhibited was 12 by 10. The best wood for it is straight-grained rosewood, as it is the stiffest for a given thinness of any we are acquainted with. The frames exhibited were of this material. Of course the shutter of the camera slide has a spring to keep the glass in its place. An inspection of the box will remove any surmises as to its proving complicated or unwieldly in use. The precautions it requires are just those which the true photographer is accustomed to at every step of his progress.

IMPORTANT EXPERIMENTS ON THE PRODUCTION OF LATENT IMAGES.

By W. R. Grove, M.A., F.R.S., Q.C.

It was known years ago to some of the German savans, that a coin or medal placed on a smooth vitreous or metallic surface and electrised, would leave impressions on that surface which became visible when breathed on. From the latter peculiarity they were called "roric figures;" and attempts were made to fix them by exposure to vapour of mercury or iodine, but without success. Where the Germans failed, Mr. Grove has succeeded. "Believing, as I have for many years," he says, "that electricity is nothing else than motion or change in matter, a force and not a fluid, I have made experiments to ascertain whether similar effects take place in cases where electrical light is visible upon insulated surfaces only."

We give a brief sketch of the experiments, adopting Mr. Grove's description where it suits our purpose. Two plates of window glass, about three inches square, were dipped in nitric acid, then washed, and dried with a clean silk handkerchief, and coated on the outside with pieces of tinfoil a little smaller than the glass. A piece of printed hand-bill was laid between the plates thus prepared; the tinfoil coatings were connected with the secondary terminals of a Ruhmkorff's coil, and removed after a few minutes' electrisation. Now, "the interior surface of the glass when breathed on, shewed with great beauty the printed words which had been opposite to it, these appearing as though etched on the glass, or having a frosted appearance; even the fibres of the paper were beautifully brought out by the breath, but nothing beyond the margin of the tinfoil." These impressions were fixed by holding them over hydrofluoric acid,—powdered fluor spar and sulphuric acid slightly warmed in a leaden dish.

"I now cut out of thin white letter-paper," proceeds Mr. Grove, "the word Volta, and placed it between the plates of glass. They were submitted to electrisation as before, and the interior surface of one of them, without the paper letters, was subsequently exposed in the hydrofluoric acid vapour; the previously invi-

sible figures came out perfectly, and formed a permanent and perfectly accurate etching of the word VOLTA, as complete as if it had been done in the usual mode by an etching ground. This, of course, could be washed and rubbed to any extent without alteration; and the results I have obtained give every promise for those who may pursue this as an art, of produeing very beautiful effects, enabling Silhouette designs, or even fine engravings, to be copied on glass, &c."

We cite yet another experiment, as it brings photography into play. A plate on which the invisible image was impressed, was immersed in a bath of nitrate of silver, in the usual manner as for a photograph. "It was then held opposite a window for a few seconds, and taken back into the darkened room; and on pouring over it a solution of pyrogallic acid, the word VOLTA, and the border of the glass beyond the limits of the tinfoil, were darkened, and came out with perfect distinctness, the other parts of the glass having been, as it were, protected by electrisation from the action of light. The figures were permanently fixed by a strong solution of hyposulphite of soda."

METHOD OF COPYING PAINTINGS, &c., WITH A COMPOUND LENS.

By A. Brothers, Esq.

As it is usually considered almost impossible to make correct copies from a flat surface with a compound lens, it may be interesting to you and the readers of the Journal to be informed how I obtain the perfect flatness of field with one 4 inches diameter. In copying it is usual to put in the stop intended to be used, and then to obtain as accurately as possible the focus of the object to be copied, the centre claiming chief attention. It will be found that if the object is put in correct focus at about one-fourth its diameter from the outer edges, and the stop then placed in the lens, the copy will be clearly defined in every part.

By the ordinary method, when a very small stop is used, it is almost impossible to focus correctly, especially in a dull light; but by adopting my suggestion, we have the advantage of the full aperture of the lens to focus by, and the stop being afterwards placed in the lens, it is unnecessary again to look at the picture in the camera (excepting to determine the length of exposure to be given), as the copy will be found to be absolutely correct.—*Journal of the Photographic Society of London, January 21st*, 1857.

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—The tendency to indulge in the vice of "fine writing,"—if so laborious a pursuit ever takes the form of an indulgence—has become so prevalent, and has been so freely exposed and censured of late in our most popular periodicals, that I must confess my surprise at the magnificent display of that species of intellectual fireworks in the last number of the *Journal of the Photographic Society of London.* The review of the London Photographic Exhibition is one of the most undoubted triumphs in the "grand style" of prose composition—gone mad—ever penned. It is graced by all the qualifications of the manner in the most eminent degree; Mr. Gilfillan himself, in his loftiest flights—even the supreme Jenkins of the *Post*, on a forthcoming "august Matrimonial Alliance"—could not surpass it; for loftiness of diction and simplicity of thought, for sound and—want of sense, it is quite unique. Standing in tone and tenour, manner and matter, "four square," a brilliant specimen of the modern mock-heroic in delirium tremens.

But however objectionable mere verbiage is to some minds, no grounds of serious complaint can be held fairly against it. It is the writer's folly or misfortune, and may be overlooked. But when grave and serious subjects, offering food for the highest and noblest speculative and religious philosophy, are flimsily and presumptuously degraded by an affectation of wit, as galling as it is clumsy and ill-timed; when assertions are made, evidently without thought, and as evidently ridiculous; or when an erroneous impression is derived from some well-known author; and when statements are needlessly introduced involving wilful scientific inaccuracy and injustice, the subject assumes another complexion. It would not be difficult to bring home any or all of these charges to the writer; and to avoid misconception of my motives, which certainly cannot be personal, for he is unknown to me, you will perhaps permit me to briefly allude to them.

There is also a form of assertion indulged in, involving the gravest statements, and covering the most unquestionable errors, which ought not to pass unnoticed. Dangerous, because insidious, it assumes results perfectly untrue, and which the writer no doubt knows to be incorrect, as proved; and then proceeds on the assumption of this proof as if it were an acknowledged fact. In this species of rhetoric must be considered the allusion to M. Claudet, in which his name is coupled with that of M. Daguerre, on terms of recognized equality in the nature of the puff oblique. Now, whatever may be the claims of M. Claudet as a photographic practitioner, I have never heard of any valuable assistance given by him to the photographic art. Certainly none which could entitle him to have his name coupled for an instant with that of M. Daguerre; and can only consider this the ill-judged act of a friend (?) which M. Claudet has certainly the greatest right to complain of, to drag another into notoriety.

Again, to select at random another sentence, we find one containing two assertions, as far as they can be understood in the obscure English in which they are couched, not less grave and erroneous. "There is no question that the irresistible tendency of modern art is towards imitation: not typical boughs, mere horns and clothes pegs; not typical clouds, mere bolsters and feather beds; not typical robes, mere moonshine and fuss; not typical faces, mere straight noses and dummy eyes; not typical leaves mere green ciphers,—but twisted snake branches, radiant domes and feathered ripples, as of angels' wings, flowing waves, and windings of silk and satin, and faces all alight with warring and volcanic passions. We want Dutch truth allied to Italian poetry, and this, more than this, photography promises, nay, gives."

Mr. Mayhew it was, I think, who once cited the sentence of a London costermonger as the *ne plus ultra* of human mis-statement and assertion, in describing some asparagus, "As them's a hexcellent grass." This sentence, which he then placed on record, must, however, give place to the one we now print. True, that was incorrect in pronunciation, in scientific nomenclature, and grammatical construction; but it was comprehensible. This, with all the errors of grammar and construction, has the additional disadvantage of being obscure and untrue.

In the first place, the tendency of modern art is not

towards imitation; and no one who knew anything of the matter could for a moment make such an assertion, if by modern art is meant the arts of sculpture and painting, as may be assumed. In the next place, Dutch truth allied to Italian poetry, is just what we do *not* want. What is wanted is the truth, untinctured by clime as far as possible. The truth as it has been sought in every age and country, by earnest and zealous minds, and which "fine writers" alone make us despair of seeing again.

The rest of the paper, elegant as it is, which ekes out no-meaning, with vague epithets, "mere moonshine and fuss," "dummy eyes," green ciphers, &c. may stand for what it is worth; and with it such phrases as "indurated colons and sluggish pylorics," "seas with a laughing and multitudinous surface," "golden expanses of calm, unruffled, sun broad, lustrous, gleaming and tranquil," "clear-sighted, peep-seeing, sure-handed, steam-power, spirit of the sun," &c., &c.

The writer, however, I sincerely hope, will not obtrude them again on the notice of photographers; what is required, I presume, in a notice of the kind, is not wit (?) or display of this style, but a plain unvarnished and truthful narrative, manifesting critical discrimination of the merits and excellencies, photographic and artistic, of the pictures: not discourses at second hand about Mr. Robson's "weak chin and full brain; bur of Mr. Watkins' good or bad printing, good or bad effect of light and shade, breadth, force, expression, correct drawing, if the phrase may be used, the excellence of the *posé*, &c., &c. At any rate, this is what is wanted by

AN OLD PHOTOGRAPHER.

Mr. M'INNES'S TRANSPARENT POSITIVES IN AMERICA, WITH NEW NAMES, "CHEMITYPE" AND "HALLOTYPE."

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—We in New York are in the midst of a civil war, exclusive of that in Kansas, for increasing the area of freedom, by spreading slavery under the especial care of the worthy President of our "Model Republic," and to be continued by the Buchaneers if they can get the opportunity. I say we have here a civil war, carried on very civilly between two psuedo-discoverers of a *new* collodion process, called by one "Chemitype," and by the other "Hallotype."

The first is "invented and introduced" by a Mr. Seely, who invents and introduces everything at second-hand, after it is described in your, or any other, Journal. The other is "*invented*" by a Mr. Hall, who has given his name to it, and sold the *secret* to several of the public practitioners, as has also Mr. Seely.

The process is precisely that of Mr. M'Innes, of Liverpool, as described in your Journal under the name of "Transparent Positives." This is the newly invented process, the lights being transparent, the glass is backed by a white or light coloured paper as may be desired. It would be quite superfluous to describe it more minutely, but it possesses an advantage over the ordinary direct prints on glass, called here "*Ambrotypes*," in which the lights of the picture are produced by pure precipitated silver, which neither of the Inventors *yet* claim for it, although after it appears in your columns they will both "*invent* and *introduce*" it at once. This advantage is, that as the lights are formed by white paper they are likely to be more permanent, especially where exposed to sulphureous vapours. It is notorious that the white silver deposit, on the ordinary glass prints, is peculiarly liable to this mishap, even more so than the old fashioned Daguerreotypes, which were covered by a film of gold. The effect of these vapours is, as every one knows, to blacken the silver, and when this once occurs the picture is lost beyond recovery; as they cannot stand being cleaned with cyanide of potassium, as the Daguerrean plate may be when partially injured by the sulphide of hydrogen.

Although my own opinion is favourable to the superior durability of these productions over the ordinary "*Ambrotypes*," yet they are not likely to supersede them, especially among the cheap establishments, because of the more than double trouble to produce them, and the lengthened sitting required to get the first impression, which must be a transfer. Where we are not willing to give more than a shilling for a map of our face, we cannot expect to get either a *Chemitype* or a *Hallotype*, but must content ourselves with one of Cutting's *Ambrotypes*, of which immense numbers are made at the above price.

W. ROSS.

26, *Second Avenue, New York*, 19*th Sept.*, 1856.

ANSWERS TO CORRESPONDENTS.

Communications for the Editor *are requested to be sent to* Mr. William Crookes, 15, Stanley-street, Brompton, London, S. W. *Correspondence on the business of the Journal to the* Publisher, 16, Canning Place, Liverpool.

M. H., Islington.—1. It is very unlikely that the small quantity of iodide of potassium added should have produced the result you mention. It is more probable that the sel d'or is impure, and we are more inclined to that opinion from the effect you describe as being produced on immersing the washed picture in it. 2. Add a quantity of crystals of hyposulphite of soda equal in weight to the original sel d'or in your bath, and filter if required; that will remedy the evil.

Nemo.—Most likely your solution of gallic acid is not strong enough. Shaking up the acid with water for a few minutes and then allowing it to settle, will not make anything like a saturated solution. If warm water be used, and the bottle be allowed to stand for half an hour up to its neck in a jug of nearly boiling water, with frequent shaking, it will, after cooling and filtering, be a saturated solution. If now Mr. Spiller's suggestion of adding a small quantity of alcohol or acetic acid to this solution be adopted, you can prepare at one time and keep in stock enough to last you for months, and thus be certain of having the solution uniform, instead of a different strength each time.

G. Newton.—Very beautiful photographic slides for the magic lantern may be obtained in many ways. Prepare a glass by any of the dry processes (albumen, Taupenot's, &c.) and print on this from the negative in exactly the same way that paper prints are obtained. Expose from ten seconds to one or two minutes, according to the light, and develope in the way recommended in the description of the above processes. As you, however, are only a beginner in the collodion process, perhaps the following plan, although slightly inferior to the above, will be found most serviceable at present:—Prepare a collodion plate in the usual manner, allow it to drain for about five minutes, resting on one corner on blotting paper, against a wall. As soon as the great excess of liquid has drained off, lay it on its back on clean blotting paper, and at each corner place a piece of very thin paper about half an inch square; then lay the negative face downwards on it, and holding them tight together in the hand, expose to the light of a lamp or gas for a few seconds, keeping them quite still, and about a foot from the source of light; develope in the usual way. The pieces of paper are to prevent absolute contact between the negative and collodion film, and consequent destruction of the latter; the developed positive is therefore not so sharp in outline as if the two plates had been pressed close together. If the collodion is good it will allow of the picture being painted with the ordinary transparent colours before varnishing.

WINDERMERE.—Mr. M'Lachlan's process, which will be given in our next, is spoken of so highly, that we cannot do better than advise waiting till it appears. As we have had good success with almost all the collodions and developing solutions with which you have failed, we should be more inclined to say the fault was in your manipulation rather than in the material employed. A paper on our own method of taking collodion negatives is in progress, perhaps that will give you some information. Your suggestion as to reprinting the paper is received with thanks and will meet with attention; at present, however, there is no room for its insertion.

GLASGUENSIS.—1. Carbonate of soda one ounce, solution of ammonia half an ounce, water ten ounces. 2. After fixing the print, immerse it in the above for ten minutes, moving it about once or twice during that time. 3. Wash in clean water for about two days, changing the water six or eight times during that time, and pouring it in each time warmer than the preceding, until the last wash is with boiling water.

PETER.—Yellow calico is very liable to produce failure if you rely on one or even two thickness to *darken* your room. Deep orange or red glass should be used where practicable.

J.B.—The same solution of hyposulphite will not do for fixing both positives and negatives, as the presence of an iodide in the positive fixing solution has a tendency to turn the lights yellow.

J.S.—The black deposit which is formed in old hyposulphite baths is sulphide of silver. The silver can be obtained from it in the following manner:—filter it and wash once or twice with boiling water, then allow it to dry, and mix with three or four times its weight of perfectly dry carbonate of soda, place it in a hessian crucible, and gradually raise this to a bright red heat in a furnace or good fire, keeping it at this temperature for about ten minutes; on cooling and breaking the crucible a button of metallic silver will be found at the bottom, if the operation has been well conducted.

A POSITIVE MAN.—Proto-nitrate of iron is very difficult to obtain crystallized. We should not advise your making the attempt, as it would most likely decompose and the solution is so easily prepared of a definite strength. Your own formula is very good.

DARLINGTON.—The problem is not how to *obtain* naturally coloured photographs, for that has been already done. The difficulty is how to *fix* the colours permanently, and, hitherto, all attempts in that direction have failed. E. Becquerel has long ago taken photographs of coloured objects in all their proper colours, but these gradually fade in the light.

X.X.—We cannot assist you.

GEORGE ——.—Will our correspondent favour us with further details on the subject, and we will gladly give it all the publicity in our power.

Communications received from A. Smith, P.Q.R., Φ. (in our next), and Thermo.

G.L.—Arrived too late for insertion.

CONTENTS.

Printed by the Proprietor, HENRY GREENWOOD, of No. 14, Fairfield Crescent, in the Parish of West Derby, at his Office, 16, Canning Place, Custom-House, Liverpool.—Feb. 1, 1857.

THE LIVERPOOL & MANCHESTER
Photographic Journal,

EDITED BY WM. CROOKES, ESQ., 15, STANLEY-ST., BROMPTON, LONDON, S.W.
Published on the 1st and 15th of each Month.

NEW SERIES.] No. 4.—FEBRUARY 15, 1857. [Price 3d. Stamped 4d.

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NDON: HORNE & THORNTHWAITE, 123, Newgate-street; H. BAILLIERE, 219, Regent-street. MANCHESTER: J. B CER, 43, Cross-street; J. J. PYNE, 63, Piccadilly. BIRMINGHAM: PERSHOUSE, JOHNSON & MORRIS, 28, Summer-row LIN: J. ROBINSON, 65, Grafton-street. BELFAST: GRATTAN & Co., 10 & 12, Corn Market. EDINBURGH: JAMES WOOD, Prince's-street. GLASGOW: WILLIAM LOVE, St. Enoch-square; JOHN SPENCER, 16, Saltmarket.

The

Liverpool & Manchester Photographic Journal.

New Series. No. 4.—FEBRUARY 15, 1857.

photography of the moon is at present ıpying very considerable attention among ntific men. In the last number were mened some successful experiments which had ı tried during the recent lunar eclipse: we lay before our readers an extract from a t interesting letter which Father Secchi, of Roman Observatory, has recently addressed ıe Abbé Moigno relative to the same subject. eover, we hope in our next to present our ers with the results of some experiments ɔh were undertaken about fourteen months by ourselves, in conjunction with Mr. Hartnup, the noble equatoreal at the Liverpool ɛrvatory, a paper on the subject of Lunar ography having been read by our Editor re the Royal Society, on Thursday last. We ve we may with justice take credit to ours for having obtained the most rapid ograph of our satellite which has yet been n: four seconds being about the time red, under not very favourable circumstances. e have already mentioned the general feas which distinguish the present Exhibition he Photographic Society of London, both the contemporary Exhibitions of other ties, and from their own former annual ctions, and we cannot help thinking that hange is for the worse. Collodion, doubthas very many advantages over every r process, but we think that the absence of rtistically beautiful productions of old wellvn paper men, is a loss which the finest dion pictures fail to supply. All who had the fortune to see the perfection to which Turner brought the Talbotype process in the views h he exhibited two years ago, must regret the present Exhibition is almost exclusively with collodion pictures. The waxed-paper ss too has been discarded by our greatest er of English landscape photography, Roger on, but still finds a steady advocate in Mr. h, some of whose pictures are scarcely disishable from collodion. Fenton's contributhis year are exclusively collodion, and most able they are as examples of how the touch master cannot fail to shew itself under cirtances which would have conquered any killed and less artistic photographer. Let f our readers imagine himself nearly five red miles away from home, working with lion on plates of the largest size, what he hope for with a bath which pertiusly refused to give anything but foggy feeble pictures? Assuredly, in the same that all the best qualities of a general are ght out in a well-conducted retreat, so grand and vast expanses of ærial perspective—river, plain, and mountain merging into sky at the far distant horizon—foggy and misty though they be, are a higher tribute to their author's consummate skill than any success, even the most perfect, could afford. As Fenton's Highland Views serve to illustrate one fault or misfortune into which photographers are liable to fall,—too much half tint,—arising either from over-exposure or want of intensity in the collodion: so Delamotte's otherwise perfect Oxford Views may be placed at the opposite extremity; they are, with hardly an exception, characterized by a great want of half tone. All the shadows pass from black to white with but little softening down, and in their abruptness shew unmistakably the employment of a very intense collodion, in a slightly acid bath. Midway between these two extremes, and approaching as nearly as possible to absolute perfection, are some views of Welsh Scenery by F. Bedford. Always famed for the high merit of his pictures, this year he has, we think, outshone any of his former productions, and one of them, a view at Bettws-y-Coed, North Wales, should be in the hands of every amateur as a specimen of the height to which it is possible for a truly artistic eye and perfect manipulation to bring this marvellous offspring of applied chemistry.

At the forthcoming Exhibition of Art Treasures of the United Kingdom, to be held at Manchester this year, it is intended to include first-rate specimens of photography. Most of our eminent photographers are exerting themselves to contribute something worthy of the occasion; and in order to give it the greatest publicity possible, we have been requested by Professor Delamotte, who has entire control over this department, to insert the following circular, which is at present being forwarded to our first photographic artists:—

Exhibition of Art Treasures of the United Kingdom, Manchester, 1857.

PHOTOGRAPHIC DEPARTMENT.

The committee are desirous that the photographic art should be well represented in the forthcoming Exhibition of Art Treasures, and have requested me to make a few inquiries on the subject.

The space that can be appropriated will not admit of more than a thousand pictures; it will therefore be necessary to exclude all that are not of first-rate merit.

The committee suggest that as complete a series as possible of portraits of eminent men should be included in the collection.

I should be glad to hear from you at your early convenience, how far you would be able to assist in this Exhibition.

I am, yours faithfully,
PHILIP H. DELAMOTTE,
KING'S COLLEGE, LONDON.

As contributions are being zealously prepared in all parts of the country, and the space to be occupied is very limited, it is particularly wished that none but pictures of the very

highest excellence in the art, or possessing some special interest, may be offered for exhibition. It is intended that the pictures shall be hung against a dark crimson back ground, in not more than three horizontal rows, so that no picture shall be in such a position as to render any of its beauties hid, and the contributions of each exhibitor will be placed together.

In our next we shall be able to give information respecting the kind of frames recommended, margin admissible, and where and how photographs are to be sent for exhibition.

Pictures by foreign artists will not be admitted, unless exhibited by persons in this country, as it is only contemplated that the art treasures possessed by our own country should be represented. Nevertheless, it should be borne in mind by intending exhibitors, that the number of pictures by foreign artists are likely to be considerable, and will represent as accurately as possible the position of the art abroad; and thus an opportunity will be afforded of a true comparison being made between the productions of our own countrymen and those of our continental rivals. Let us, for the credit of Old England, show that the land which gave birth to the art, does not lack either talent or skill to hold the high position thus acquired.

Liverpool Photographic Society.—The next meeting of the Society will be held on Tuesday evening next, at the Royal Institution, Colquitt-street. when Mr. G. R. Berry will read an interesting Paper entitled "An examination of the collodion process chemically and practically, including the different theories respecting the formation and development of the primary or latent image, as involved in the dry process; illustrated by experiments."

Test for the Purity of Hyposulphite of Soda.—Weigh out accurately ten grains of nitrate of silver, dissolve this in half an ounce of distilled water; then add four grains of chloride of sodium (common salt), also dissolved in water. On mixing these two solutions together, a white curdy precipitate of chloride of silver will fall down. Next add twenty-two grains of the hyposulphite of soda, and allow it to stand for about ten minutes, stirring occasionally with a glass rod. If at the end of that time the chloride of silver has dissolved, the hyposulphite of soda may be considered as pure. A greater or less amount of residue will indicate roughly the degree of impurity.

New Method of Removing Collodion Negatives from the Glass.—In the imperial printing establishment at Vienna, M. Auër has introduced some most important and successful improvements. In the photographic department almost all the positives are printed from collodion negatives, which have been removed from the glass by means of steam, after having been covered with a coating formed of a mixture of gutta percha dissolved in chloroform and gelatine from parchment. The new negatives are perfectly transparent, and so soften down the light which passes through them as to produce incomparably better and more mellow positives.

MANCHESTER PHOTOGRAPHIC SOCIETY.

Meetings of the council and of the memb of this society were held at the house of t Literary and Philosophical Society, Georg street, on Wednesday evening, the 4th instan

At the meeting of the council, Mr. Lund the chair, the secretary (Mr. S. Cottam) w directed to inquire from Mr. Delamotte, wh appointed to superintend the photographic partment of the Art Treasures Exhibition, wl arrangements are being made with reference that department; and Mr. Delamotte was elec an honorary member of the society.

A resolution was adopted to the effect t any member of the Liverpool or other Pho graphic Societies, when visiting Manches may be permitted to attend the meetings of t Society on signing his name in the visitors' bo

In compliance with the request of sev members, Mr. Sidebotham will, at the n meeting of the members, read a paper on collodio-albumen process.

A list of subscriptions to the testimonial Mr. F. Scott Archer, the inventor of the co dion process, was read.

At the meeting of the members, Profes Frankland presided.

Mr. Edmund Burns submitted for inspec and explained a newly-constructed cam stand, particularly adapted for landscape ph graphy. The novelty consisted in a do tripod, with telescopic movement, the u half of each leg being secured by a screw. has been found difficult to adjust a ca sufficiently level to take a view without tortion; the difficulty is greater on unlev soft ground, and, a leg having been moved, it cannot sometimes be re-adjusted the requisite stability. By this stand, necessity for disturbing any one leg is obvi a screw being slackened, the leg may be e lengthened or shortened, and a correspon difference thus obtained in the level of table upon which the camera stands.

A paper upon the collodion process was by Mr. L. M'Lachlan, to whom the than the meeting were voted. [We did not re the copy in time for insertion in this nu but it will be given in our next.—Ed. L. & M.

Several observations were made in refe to the cleaning of glass plates. Mr. N stated that he had found old collodion a c detergent; and the chairman said that, sidering the materials of which it is ma ought theoretically to be the best clea substance. Other members stated that had done the same thing.

Mr. Sidebotham said that the society now be considered as fairly located withi building, and the members must, therefor sider how the society could be made useful. As one means of utility, he pr that a portfolio should be obtained and dep in the library of the Literary and Philoso Society, and that each member should con a few of his best productions every year, s at the back certain particulars as to th cesses and the materials used. In a shor such a collection would be valuable and esting, exhibiting, as he hoped it wou

ıy peculiarities of development, as well as the ·adual improvement made by the members in eir practice of the art.

The motion was seconded and carried.

A collection of M'Pherson's Roman photo-·aphs, and two photo-lithographs, were in-›ected with much satisfaction.

The proceedings closed with an expression ' thanks to Professor Frankland for presiding.

'E now give the remaining portion of the marks of the Rev. J. B. Read upon the most ıportant of the pictures on view at the Exhi-tion of the Manchester Photographic Society, read by him on the 7th ultimo :—

This brings us to the entranee of the MANCHESTER ›URT—a court seeond to none in the Exhibition.

The choice ornament of this eourt, and, indeed, the whole Exhibition, is 276, a pieture of the ·renees, taken, I believe, by Mr. Maxwell Lyte, e Photographer *redivivus.* whose early death we ere sometime ago prematurely lamenting, and to hom we owe very much. The picture needs exa-ining to diseover its beauties, whieh reside as ueh in the exeeution as in the subjeet.

273. *New Pasture Falls, Yorkshire,* J. &. R. Mudd, -affords a rare specimen of transparent water in e falls.

284. *Fairy Falls, Bishopdale, Yorkshire,* J. &. R. udd,—is another, and perhaps still more success-l picture of the same character.

281. *Heywood Farmyard, Cheshire,* J. &. R. Mudd, -well exhibits the softness and delicacy of whieh axed paper is capable.

288. *Taking in Ballast,* Arthur Neild,—is a not ss admirable specimen of a eollodion pieture, the bjeet admirably chosen, and well rendered, ideal-ed even in the midst of its reality.

In 290, *Cottages, Bowdon,* A. Neild,—we come ;ain upon a eollodion pieture (erroneously described ; a ealotype) of great excellence, and distinguished the number and natural disposition of the figures contains.

297 and 300 are two most effective views of *Bolton bbey,* by A. Neild; while the three, 305, 307, 310, ' *Tintern,* by A. Barton, would alone repay a jour-ey thither.

Of the next series, 325, 326, and 327, by J. & R. ludd, are most admirable. Is not that miller's cot-ıge quite a study? And how grandly do the eolossal imensions of the Menai Bridge stand out in the ext pieture; while in 327, formed of two pietures cilfully united, we have a view of Conway Castle, ery fine and very far from commonplaee.

346. *Dunham, Cheshire,* by the same artists,—is ı unpretending pieture of eonsummate beauty. ook along that winding road, and you cannot, I n sure, help admiring it.

350 and 351. *Houghend Hall,* and *Clough,* J. &. R. udd,—are beautiful pictures of a spot familiar to ıe botanists and entomologists of our own neigh-›urhood.

352 and 353. *Furness Abbey, &c.,* by the Soeiety's ecretary, are worthy of remark for the hint they ve how to make the most of small pietures. The inted titles may be, to some, an example worth lopting.

354, *Reigate, Surrey,* and 359, *Peacock Inn, Rows-y,* and the other pietures by J. Compton, Jun., are xcellent examples of calotype pictures, though one of them deal with subjects of mueh difficulty.

In 370, *Llanthoris Abbey,* 372, *Tintern Abbey,* and 74, *The Moat, Raglan Castle,* we find marvellous enderness of treatment, such as no proeess eould ive but the waxed-paper, handled by a skilful ma-ipulator and a true artist. *The Moat,* 374, and *The Gateway,* are other pictures of very great beauty; and it is well worth while for a visitor to compare these pietures, by Mr. Sidebotham, with those printed upon copper by Mr. Pretsch, whieh hang on the side of the lantern room.

378. *No such place,* O. G. Rejlander,—is a eurio-sity of Photography. Several negatives—six, I believe—have been used, one after another, to pro-duee this strange medley, which does not seem to me to reward the patience and eare it must have cost to print it.

380—392. We have here another interesting and very pretty Welsh series, by G. Wardley, not so mueh made of in the printing-frame, perhaps, as might be, but still searcely inferior, if at all, to some larger pietures of similar seenes. 380 and 392, *Conway,* are espeeially beautiful, and deserve careful examination.

397 eontains two interesting bits of Photography by Mr. Sidebotham, from a model of the moon by Mr. Nasmyth; giving a better notion of a telescopic view of the moon's surfaee than most drawings.

409. This portrait ought to be looked at in eompa-rison with Mr. Barnes's pieture on the first sereen. Though evidently not quite enough exposed, it shews a great advanee in rapidity upon any dry eollodion with whieh we have been hitherto aequainted.

413. *Neuvillier, Alsace.*—A fine specimen of the Photo-lithography whieh a little while ago made its first steps in publie, but has for a time been asleep again. It will probably shew itself a formidable rival ere long to the perfeeted proeess of M. Pretseh, for whieh no better name has yet been found than his own—Photo-galvanography.

430. *Scarborough Castle,* by A. Neild,—is a very interesting contribution, enabling us to eompare Mr. Sutton's much-vaunted permanent printing with the more brilliant results of the simpler sun-pietures.

The four photographs mounted together as 431, are admirable views by Mr. Lavender; especially *Turton Tower* (pictures of whieh were asked for, for our illustrations), and *Laxey, looking down the glen.*

Mr. Rejlander's pietures, several of which are scattered through the room, but the greater part eolleeted together between 444 and 457, are, upon the whole, rather admirable as feats in Photography than beautiful as works of art: yet in 89, *Don't cry, Mamma!* and 454, *Weston,* there is a tenderness and power from whieh one ought not to withhold high praise. The true artist in pictures like these is the sitter rather than the photographer. The *Anatomical Study,* 446, would be more useful had the light been more eonfined, so as to throw deeper and better-marked shadows.

Mr. Roger Fenton's Crimean series, the best of which eomplete the eontents of this room, have been so long before the public that nothing need be said of them here. One, No. 491, has been bought, I am told, by an offieer now resident in Manchester, who reeognised in the foreground his own Crimean tent. Another instanee of a similar kind oeeurred, when a gentleman ordered a eopy of one of the pietures of *Birch Church,* in whieh he discovered the tomb-stone of a dear relative. One other anecdote—A poliee-offieer in eharge of the room was diseovered, early in the eourse of the Exhibition, all but in tears before a pieture of *Bolton Abbey,* where he said his father and his mother were interred.

In the Lantern Room, the ehief objeets of interest are the Australian portraits and Mr. Pretsch's pie-tures, with Mr. M'Laehlan's series of portraits and stereoscopie pictures from Sydenham, and some positive portraits of mark by Mr. Brothers.

Baldus's pictures in this room are below the standard one would expect; there is a woolliness and want of delicaey very far from satisfaetory. In the *Swiss Cottage* we have boldness and breadth, but

none of the pictures of the late inundation are at all remarkable for power.

587 exhibits a curious adoption of a witticism. The night effect of the *Kinburn Postern* is a lesson to many of us, and when we get a proof darker than we wish, we have only to label it, "*Effet de nuit.*"

Room 16, from 601 to 684, needs little comment at my hands. They shew the power of collodion and the skill of Messrs. Bisson Freres, by whom they are contributed. And I will not presume to take up more of your time by a detailed criticism, which could in no degree add to your appreciation of the pictures.

Manchester Photographic Society.—The next meeting of the members of this Society is intended to be held at the house of the Literary and Philosophical Society, No. 36, George-street, on Wednesday evening, the 4th March, at seven o'clock, when a paper will be read by Mr. Sidebotham, on the Collodio-albumen Process.

LONDON PHOTOGRAPHIC SOCIETY.

The anniversary meeting of the above Society was held on Thursday, the 5th instant, the President, Sir F. Pollock, Lord Chief Baron, occupying the chair.

The minutes of the last meeting were read and confirmed, and several new members were elected.

The President then addressed a few remarks to the meeting, relative to the progress which had been made in photography during the past year.

The Auditors' report on the accounts of the Society was then read, and appended to it were some observations by Mr. M. Marshall, suggesting several improvements on the present system of keeping the accounts, so that the work of the auditors might be simplified another year.

The Secretary then read the annual report, of which the following is an abstract:—

The council commenced with the pleasing duty of once more congratulating the Society on the flourishing condition in which it is at present, as shewn by the balance sheet, which announces a deposit account at the bank of £1000; the accession of new members, which is more than double that of the former year; and the profit on the Journal, which for this last year has been more than £300. The Exhibition was stated as being far in advance of other years, both in number and variety of contents; already there is a receipt of £25 over the corresponding monthly income last year. The royal visit and soirée were then alluded to, the latter as having already caused a large increase of new members. The photographic department of the Art Treasures Exhibition at Manchester was noticed, and the attention and co-operation of members of the Society were desired towards the furtherance of the splendid scheme already marked out. The recognition of photography as one of the educational wants of the times, was then mentioned in connection with Mr. Hardwich's recent appointment at King's College; and the increase of provincial societies was adduced as a proof of the great interest and popularity which photography has attained. The high position which English photographers held at the Brussels Exhibition, and the fact that most of those who obtained prizes were members of this Society, could not fail to be gratifying to the general body. The council then stated that they had kept in mind the necessity of providing proper meeting and reading rooms for the members, and much time and trouble had been spent in the negociation for taking Uxbridge House on joint tenancy with the Institute of British Architects, which body had, at the last moment, unaccountably refused to receive the Society as joint tenants. They trusted, however, that another year would see them provided with accommodation suitable to the importance of the Society. It was then stated that Mr. Thomas Chambers, M.P., would shortly bring before parliament the question of copyright, as applied to photography, and, in conclusion, attention was drawn to the important papers read at the meetings, as evidence of the assistance which the Society gives to the science and practice of photography.

The following are the council and officers for the ensuing year:

President:

The Right Hon. Sir Fred. Pollock, Lord Chief Baron.

Vice-Presidents:

H. W. Diamond, M.D., F.S.A.	Sir W. J. Newton

John Percy, M.D., F.R.S.

Members of Council:

Mark Anthony	T. A. Malone
Ernest Becker, Ph.D.	H. Pollock
Professor Bell, F.R.S.	M. J. Rippingham
Sir Geo. Clerk, Bart.	A. Rosling, *Treasurer*
The Earl of Craven	George Shadbolt
William Crookes	G. Stokes
P. W. Fry	B. B. Turner
R. Fenton	C. Vignoles, F.R.S.
T. F. Hardwich	F. H. Wenham
T. G. Mackinlay, F.S.A.	Sir T. M. Wilson, Bart.

Secretary.—Rev. J. R. Major, M.A., F.S.A.

After the report was read a discussion ensued respecting the necessity of obtaining rooms for the society, in which Sir W. J. Newton, Mr. Anthony, and Mr. Crace, took part. Upon the latter gentleman complaining that the committee appointed for that purpose had been negligent in performing their duties, Mr. Anthony stated, that no one, who had not experienced the difficulties of finding fitting accommodation for the society, could have the least idea of the labour thrown upon the committee; and concluded by proposing that Mr. Crace be appointed one of a sub-committee for carrying out the above object, when doubtless those difficulties would be speedily overcome.

A description of a machine for washing positive prints after fixing was then read by Mr. R. Fox. The following is an abstract of the paper, which was illustrated by diagrams:—

In this machine the principle of employing a sponge in the washing of positive pictures is adopted. It has been made for prints of a size of 6 by 8 inches and under. A slab of plate glass is supported on two pieces of one inch deal, placed crossways to prevent warping, and firmly bolted together with screws. Over the slab of glass a piece of very fine calico is firmly stretched, and a frame is made to fall over this covered slab and blocks of wood, across the top of which another piece of fine calico is stretched. These are so arranged that a print can be laid on the piece of calico immediately covering the slab of glass, and then the second piece of stretched calico may be placed immediately over it. It is now ready for sponging, which may either be done by hand or by means of a lever which is attached to the upper part of the

framework. By its means an oblong bag containing a sponge the size of the slab of glass may be pressed in close contact with the two pieces of calico which enclose the print. The pad of sponge is constantly wetted by means of a tap which is kept running into a funnel fastened on the top of the lever, and distributing the water uniformly in the interior of the sponge bag. The lever is to be moved with a quick and firm motion so long as is considered necessary. The author considers that five minutes washing with this machine is equal to five hours, or perhaps five days steeping, in the ordinary manner.

There were exhibited on the table several very beautiful specimens of portraits, both coloured and plain, taken by Mr. Mayall, and printed by him on his artificial ivory surface, formed by coagulating a paste of sulphate of baryta and albumen.

A new stereoscopic camera and dark box, invented by Mr. Atkinson of Manchester-street, Liverpool, was also exhibited.

The meeting, which passed off more harmoniously than any previous anniversary of the Society, then terminated.

REMARKS ON THE PHOTOGRAPHY OF THE MOON.

By William Crookes.

Besides the pictures taken in America—which are almost valueless as moon maps, the sides being reversed in copying from the daguerreotype plates upon which they were originally taken—the moon has been photographed by Professor Phillips, Father Secchi, MM. Bertsch and Arnauld, Messrs. Berry, Forrest and Edwards, of Liverpool, and Mr. Hartnup and myself. It is interesting and instructive to compare among themselves the means employed and the time occupied in taking the impression on thsee several occasions.

Professor Phillips' telescope has a sidereal focus of 11 feet, and an aperture of 6½ inches; consequently the brilliancy of the moon's image at the focus is augmented 26 times over what she appears to the naked eye. The average time occupied for the collodion plate to receive the impression was about 3 minutes.*

Father Seechi's telescope having a sidereal focus of 18 times its aperture, the moon's image was intensified 37·8 times, and the time required for the impression was on an average 6 minutes.†

M. Parro's glass of 49 feet sidereal focus and 20 inches aperture, gave a moon image 12·3 times brighter than she appears to the naked eye, and the average time of taking the picture was 17 seconds.‡

Mr. Hartnup's telescope being 12½ feet focus and 8 inches aperture, augments the intensity of the moon's image at its focus 35·1 times. The time which was required for the photograph of our satellite to be taken, on the occasion of the meeting of the British Association at Liverpool, in 1854, was about 2 minutes;§ and under the same circumstances I succeeded in obtaining perfect and intense negatives in 4 seconds. These, however, were taken under very unfavourable circumstances, the temperature being below the freezing point, and the moon at a considerable distance from the meridian, which necessarily caused both a diminution of the light and also a diminished sensitiveness of the collodion film.

The rapidity with which the above pictures were taken may be better understood by comparing them with those of terrestrial objects under similar circumstances. According to Herschel*—

"The actual illumination of the lunar surface is not much superior to that of weathered sandstone rock in full sunshine. I have frequently compared the moon setting behind the grey perpendicular façade of the table mountain, illuminated by the sun just risen in the opposite quarter of the horizon, when it has been scarcely distinguishable in brightness from the rock in contact with it. The sun and moon being nearly at equal altitudes, and the atmosphere perfectly free from cloud or vapour, its effect is alike on both luminaries."

Thus, by comparing the power of the Liverpool object glass with that of our ordinary camera lens, its focal length being nearly 19 times the aperture, and the moon's image being copied by its means in 4 seconds, we find that it is equivalent to copying sandstone illuminated by the sun in 4 seconds with a lens 4½ inches focus and a little less than a ¼ inch diaphragm; or with a compound lens having an aperture of one inch, and the same focal length, in a quarter of a second.

I attribute the greater sensitiveness which I obtained to the excellence of the materials employed; and in the next number I hope to be able to give, along with an abstract of the Royal Society's paper, an account of the way in which the whole of these were prepared, sufficiently explicit to place the extraordinary rapidity of action which I obtained, in the power of any one who may take the trouble to follow carefully my instructions.

* Athenæum, 1853, page 1131. † Cosmos, Vol. 9, pp. 425 549. ‡ Cosmos, Vol. 9, p. 444. § Liverpool Photographic Journal, Vol. 1., pp. 34, 72, 138.

* Herschel's Outlines of Astronomy, page 249.

LUNAR PHOTOGRAPHY.

By Father Secchi.

There are several most important scientific questions concerning the present physical constitution of our satellite which photography is destined to solve. Thus, Lambert believes that the centre of the disk of the full moon is much more luminous than the borders; photography can answer this question in the same way that the thermo-electric multiplier has resolved the question of the greater intensity of the heat rays emanating from the centre of the solar disk. Moreover, the distribution of light and shade on the surface possesses much interest, and the relation between the reflecting powers of lunar substances and well known terrestrial bodies may lead us to some knowledge of the nature of our satellite. My researches have led me to think that the lunar surface is similar to the volcanic rocks on the earth. Photography also shows very well the effect of the solar penumbra on the moon, and perhaps we may have from the same source a solution of the question relative to the atmosphere of our satellite. You perceive that these questions are on subjects of great scientific interest.

With respect to the size of the photographic images of the moon, I am enabled to magnify them to six or seven inches in diameter; but I am convinced that to have a good lunar map, it must not be taken at one time. In the full moon the craters are indiscernable to the eye, on account of their small absolute height, and thus in this phase only a general view of the surface can be seen. I even think that to get a good picture it will be necessary to employ a daguerreotype plate, as collodion in drying, and even during the operation, is liable to be distorted. After this general outline has been taken, then by taking the phases one by one, the details can be filled in. In the last pictures craters of only a few seconds' diameter are preserved in all their accuracy, their interior cavities being well traced and perfectly black. Unfortunately the light is extremely faint, and if great sensitiveness is wanted there is much risk of spoiling the picture. I am not acquainted with the details of the manipulations as practised in other observatories, but having heard some surprise expressed at the long time employed in taking these pictures, I can say that this was not the fault of the collodion, as in an ordinary camera a picture could be taken with it in a second, and even less. But it must be borne in mind that in photographic lenses the focal length is at most four or five times the aperture, while in my object glass this focal length is eighteen times the aperture, which very considerably retards the action of the light. For that reason I have adopted, as a comparison, the time employed to take a terrestial object with the same glass. In these experiments it has appeared to me that the focus of the lens for the moon ought to be lengthened more than for terrestial objects—a fact which will be interesting as bearing upon the constitution of the matter of the moon.—*Cosmos.*

RAPID WAXED PAPER PROCESS.

By M. De la Blanchere.

After the sheet of paper has been properly waxed it is ready for iodizing. The following special conditions are to be observed in the preparation of this bath:—It should contain a size strong enough to fill up the pores of the paper and make it more approaching the condition of a smooth, inert surface. If too thick the size produces oblong drops or irregular lines on the sheet when hung up to dry, which are liable to form black stains in the gallic acid developing solution. The iodide should not be in too large quantity, otherwise, after having penetrated the pores of the paper, there is formed in the exciting medium too dense a film of iodide of silver, which produces thick and opaque pictures.

The sizing is produced in the following manner:—take

Water	1 quart
Best rice	5 ounces
Linseed	$1\frac{1}{2}$ „
Isinglass or fine gelatine	$\frac{3}{4}$ „

The latter should be dissolved by aid of heat, and more especially if isinglass be preferred, as this takes a much longer time. The rice and linseed should be allowed to digest a little; the former should have no grains burst.

For the iodizing bath; take

Size (prepared as above and filtered while warm through linen)	$1\frac{3}{4}$ pints
Milk sugar	$1\frac{3}{4}$ ounces
Iodide of potassium	9 drachms
Bromide of potassium	80 grains

The sheets are to be immersed one after the other for ten minutes at most, carefully avoiding air bubbles, and then hung up to dry.

The paper thus prepared will remain good for two or three months, and after that time it can be restored to its first freshness by re-immersing in the iodizing bath.

The remaining operations of exciting, &c., are performed in the ordinary manner.

THE ALBUMEN PROCESS.*

By Mr. James Ross.

"I shall commence with the preparation of the albumen. I take eggs of medium age, and having selected as many as I think will be required to coat the plates to be prepared, I break them one by one on the edge of the vessel that is to contain the albumen, and then separate the white from the yolk. Having picked out all the insoluble parts, I add to the albumen 30 drops of a saturated solution of iodide of potassium, and half a wine glassful of water to each egg. The whole is then switched up into a large mass of froth, and set aside till it falls. I should mention that it is very essential that the albumen be thoroughly beaten up; the froth must be quite stiff and thick. More or less iodide of potassium may be added, according to the quantity of nitrate of silver to be subsequently used, and the degree of sensitiveness desired; but it is not advisable to increase the quantity of chemicals beyond a certain point, as it is liable to cause the albumen to crack off.

"I now take a clean glass plate, and having exposed it for a moment to steam from hot water, I pour the albumen plentifully upon it. The effect of the steam is to make the albumen flow freely over the plate. As soon as it has run over every part, the albumen is poured off. It is unnecessary to preserve what is poured off, as, unlike collodion, it must never be used again in the preparation of plates, even though again beaten up. I now hook the plate by the two opposite corners to a piece of bent wire, to which is attached a piece of worsted thread, so that when I hold the thread the plate is in a horizontal position, with the prepared face downwards. Holding it in front of a clear fire, or better, above a close stove, a rotating motion is given to the plate by twisting the thread, exactly as in the common form of kitchen jack. The centrifugal force then produced, causes the albumen to spread equally over the whole plate, what is superfluous running off from the edges. By no other means can so even a coating be obtained, and photographers are greatly indebted to Mr. M'Craw, of Edinburgh, for the exceedingly ingenious and simple invention. The plate is made to revolve till slight cracks appear in the albumen at the edges of the plate. It must now be at once removed from the fire, for if at

* Read at the January Meeting of the Photographic Society of Scotland.

all over-heated, the nature of the albumen is altogether changed. The cracks soon spread of themselves over the whole plate, which shows that the coating has become equally firm. In this state the plate may be kept some time.

"I now proceed to sensitize the plate—First, I breathe very freely over the whole of it, for the purpose of in some degree re-softening the albumen, as it absorbs far more silver in that state than if very hard and dry. A bath is prepared with 120 grs. of nitrate of silver, and 10 drops of glacial acetic acid, to the ounce of water. I dip the plate in this bath by a single movement, and immediately remove it. It is now to be rinsed, say three times, in the same cold water. If too much washed it will lose sensitiveness, and if too little, the silver will crystallize on the surface of the plate. It is now ready for exposure in the camera."

To illustrate the operation of taking and developing a picture on a prepared plate, a copy of a bas-relief of "Night," by Thorwaldsen, was arranged so as to be lighted by a single common gas-burner of a larger size. The camera was provided with a double achromatic lens of Voightlander, and fifteen minutes' exposure were sufficient to secure a good impression. On removing the plate from the camera, a saturated solution of gallic acid was poured on it, which caused the picture to appear in about two or three minutes, of a beautiful clear red colour. A little of the silver bath was now added to give density to the picture. In the course of fifteen minutes it became perfectly vigorous and black in the lights, and clear and transparent in the shadows.

"About one half the time of exposure in the camera would have been sufficient, had the picture been allowed to develop slowly; or had pyrogallic acid been used in the development. Had honey been mixed with the albumen, the action would have been far quicker and more magical: but though pyrogallic acid acts more quickly, it does not give so intense pictures as gallic acid; and I have never succeeded in getting large pictures free from blisters when honey was used."

The picture was now fixed by pouring over it a solution of hyposulphite of soda, 40 grs. to the oz. of water, and then washed thoroughly by pouring over it a stream of water as gently as possible, so as not to break the coating of albumen. When dry it was finished, and, needing no varnishing, was ready for printing.

"I may add, that nothing can be easier than to coat plates for taking views of ruins, as a defect in the spreading of the albumen sometimes makes a positive beauty in the picture, as defective skies can be all stopped with daubs of black paint. But it is a more difficult thing to coat large plates all over so evenly as to give a picture of sky and distance, united in harmony with the foreground. This can be done however, if the manipulation of the albumen is well managed, and then the picture is more satisfactory and truthful than when the same is attempted with collodion or paper. By either of the latter processes the sky is generally so dense that when printed it leaves the paper so clean and clear that the result is like a whitewashed wall, instead of having an appearance of distance and air. In such photographs there is generally no "bridal of the earth and sky," but rather a complete divorce. Of course albumen is too slow a process to give moving clouds, but it invariably gives the *feeling* of sky and air."

"Under favourable circumstances, with a double Voightlander lens, from three to four minutes' exposure in the camera would be sufficient: the well-known views of Edinburgh, from Nelson's monument, which were about twelve inches square, having been taken with a single achromatic lens, had an exposure of about twenty minutes. Prepared plates would keep good without any material diminution of sensitiveness for two days before taking a picture; on keeping them longer than that time a good result might still be obtained, but the exposure would have to be correspondingly lengthened. They might be quite well developed a week after the plate had been prepared and the picture taken."

THE "HILLOTYPE" PROCESS.

We have been favoured by our correspondent, Mr. W. Ross, of New York, with the following *exposé* of the entire mystery of the "Hillotype," as given in a review which appears in the Dec. number of *Humphrey's Journal*:—

Hillotype.

We promised in our last, to give a final exposition of the Hillotype. We intended to do this by extracts from the Rev. Hill's book. But we have concluded not to do it in that way, for the plausible reason, that the matter is not worthy of our space, and that we can condense the real substance into a nut shell.

First, as to the Book.—It contains about 300 pages, and when we assure our readers that the writing is the real genuine original production of Mr. Hill, they should know, as well as ourselves, the style and method. The first third of the book is devoted to biography and glorification of the author. We know from it the precise day when the hero was born—how he got through childhood as to measles, chicken pox, &c.—how he worked hard at a trade—how he barely achieved a theological education by keeping bachelor's hall, stinting his diet by an outlay of only a few shillings per week—how he preached with unction—was attacked with bronchitis—and became a strolling daguerreotypist—how he chiselled the N. Y. speculators as to the magic buff by his own sharper practice, putting 500 dollars in his own pocket thereby (glorifying all the time)—how he realized 10,000 dollars out of his various speculations—how he was almost a doctor, having great success, although his patient died, with herb tea and steam. We have, of course, all the ancient groanings and lamentations for his miserable health. The balance of the book is made up of those famous certificates and a Hillesque rehash of Hunt's Photography, and some articles that have appeared in the journals.

But the Hillotype!!—The great subject of Hillotype proper, is treated in the space of five or six pages. Hill promises to make a clean breast of it, and give us the whole practical process. We have many times heretofore expressed the opinion, that Mr. Hill was indebted to Becquerel, St. Victor, and Campbell for all he knew on the subject. The opinion is confirmed into a fixed fact, that he has originated nothing. The former well-known processes are sought to be disguised by trifling modifications—or by a confused way of desrcibing them. The renowned magical buffer puts his daguerreotpye plate through

a multitude of washings and dryings—heatings and coolings—iodizings and mercurializing, &c.—finally getting back his daguerreotype plate in essentially its original state, only a little the worse for the various tortures. Next he prepares a grand hotchpotch, or "non descript compound,"—a regular witch soup—which in the end furnishes him with the salts of copper, which St. Victor recommends. He coats his plate—exposes it under a lithograph or otherwise—and at last he shows us the "gorgeous" picture, more life-like than the reality.

If any one has a desire to study the subject of Heliochromy, we advise him to go to the original sources and learn the simple methods of a scientific man.

In conclusion, we would only add by way of news, that Mr. D. D. T. Davie, of Utica, is proceeding to obtain an injunction on the sale of Hill's book, and that the said book is now offered for sale by sub-agents, at 2 dollars per copy; that the original Hill has gone into the liquor business, promising to make alcohol out of gas (?) for 20 cents per gallon. Hillotype adieu!

We hear from Paris that all the Assyrian, Egyptian, Greek, and Roman inscriptions to be found on the granite and marble monuments in the Museum of the Louvre, as well as in the Imperial Library, are to be reproduced and multiplied by photography. The celebrated inscription of Rosetta, likewise, written in three languages, which furnished Champollion with the key to the hieroglyphs, will be produced in numerous galvano-plastic copies.—*Athenæum.*

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—I do not hesitate to take liberty to send you a new process for keeping collodion sensitive, as I know its great value to photographers; for although the oxymel keeps the film *sensitive*, it is not perfect, at least I have not succeeded in obtaining one good picture by that process. My process is as follows, and I have no hesitation in assuring you that it is absolutely perfect, insomuch that at the end of a week, the longest time I have kept them, (though I do not doubt it would do after a much longer time,) the result is equal in every respect to fresh made collodion.

To 1 ounce of distilled or filtered rain water, add 3 drachms of best loaf sugar, the water to be almost or quite boiling, so that the solution shall be perfect. Filter whilst pretty hot, as I find the filtration then much more rapid than when cold. After sensitising, place the plate in distilled or rain water in a dish for 4 minutes; then wash it pretty well with the same kind of water, and let it stand to drain for a minute. Then put it into the saccharine solution (in a dish) for 4 or 5 minutes: drain, holding the glass upright and parallel to the dish, just tilting it corner-ways towards the end of draining, and then place it edgeways on clean blotting paper, where it may rest for a quarter of an hour; then remove it to a dry part of the paper, which prevents moisture at the bottom edge. The glasses should be put by in a perfectly dark place for future use, which, as I said, may be at the end of a week. The exposure in camera should be 10 minutes in a sunny day, and for a quarter of an hour in dark weather. Previous to developing place the plate in *quite hot* rain water for 7 minutes; wash pretty copiously with cold water. Develope with pyrogallic acid, 2 grs. per ounce, adding at the very beginning, 5 drops of a 30 grain solution of silver, which will bring out the picture in about a minute, when add 5 or 6 drops more of silver, which will effect a perfect negative. I should say that the 5 drops of silver are to be put to about the third of an ounce of the pyrogallic, and when the picture is out, pour this off into a clean small phial, and add the other 5 or 6 drops of silver. Fix with hypo, &c.

I offer this as a process always to be relied on, and therefore invaluable; for I have tried it at least 150 times without the least failure, even from the first.

It is my belief that when this becomes better known it will entirely supersede the paper process, which is very troublesome, beautiful though the pictures be.

I trust you will try this, and make it known, as I feel certain that if these directions be followed, failure is out of the question.

It may be well to add that the same dish of water, after sensitizing, will do for as many plates as may be generally required.—Your obedient servant,

T. L. MERRITT.

Maidstone, Feb. 9th, 1857.

Large Lenses and Large Pictures.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—In the report of the September meeting of the Liverpool Photographic Society, Mr. J. R. Isaac, in noticing the magnificent prints of M. Bisson Freres, of Paris, says that the lenses with which the transfers were made, were of the enormous diameter of fourteen French, or sixteen British inches. If such be their diameter it far surpasses that of any other lenses used in the art, or even in the largest astronomical instruments of which I have any intimation. I cannot lay my hand at this moment on the description of the *Craig* telescope near London, and therefore cannot tell the diameter of its object lens, but I have before me a recent catalogue of Lerebours and Co., in which no such large lens is mentioned. I have also before me *La Lumière*, in which the lens of the Messrs. Bisson is mentioned, and also the *Cosmos*, of the 29th June, 1855, where, in page 724, the diameter of their lens is given as between eight and nine inches, (*de huit a neuf,*) and is a single achromatic, made by *Chevalier, Lerebours,* and *Jamin.* As it is probable they have more than one such lens, Chevalier may have made one or more of them, and Lerebours and Jamin the others; this may be the reason the precise diameter is not given, as some may be eight and others nine inches diameter. Be that as it may, there is a very considerable discrepancy between both statements, and it would be interesting to know which is right. My own achromatic lens of six inches diameter and forty-two inches focus was pretty fair, but sixteen inches staggered my faith. It is not at all necessary in practice to use large lenses, unless where a large print is required to be taken *direct from the object*, whatever it may be. It is extremely doubtful whether any saving of time is effected by so large a picture taken at one operation over what would be required to take, first, a transfer of moderate size with a lens of 12 in. focus, and afterwards enlarging it in a megascopic camera properly arranged. Practitioners who may wish to take large pictures should try the megascopic camera first, before incurring the immense expense of the large lens with its appendages. An enormous camera box is not at all required for such a purpose, as the prepared paper should be attached to an ordinary drawing board, which can be readily placed in the focus of the lens. Any of the haloid salts will do to impregnate the paper, but where a process by development is to be followed no chloride should be used, otherwise, from its exceeding sensibility to very feeble light, it will blacken all over as soon as the developing liquid is applied. Where it is not intended

to *develop* the print, the chloride is best; but in this case where the impression is enlarged to several times the size of the transfer, a vigorous or intense print cannot be produced, besides the time of exposure being very greatly prolonged.

The reason of this is easily seen. If we consider the size of the transfer to be four inches square, and the print to be to it in the ratio of three to one, this would be twelve inches square, or an area of 144 square inches, over which the quantity of light from the transfer of sixteen square inches area would have to spread. It is easily seen that these numbers are as one to nine, or in other words, the light from the transfer has to diffuse or spread itself over nine times more space, and will be in the same proportion a longer time in producing its effect. At the same time the parts forming the shades of the transfer will be enlarged in an equal proportion, while their intensity or depth will be considerably diminished—that is to say, they will not be so dark as they are in the transfer. Owing to the weakening of the light parts and the lightening of the dark parts, the action of the light is more equalized over the whole paper; hence, if the action of the light is long enough continued to give intense shades, the parts which should be white will have become too much discoloured to become clear in any clearing or toning bath, which will not at the same time remove much of the detail and destroy the value of the impression. This is the case with any print of increased size, but very much more so with an undeveloped print than with one which has been developed; and this renders it indispensible that the transfer from which an enlarged print is to be taken be more intense than when one of the same size only is required. All *our* life-size face maps here are removed from the light just as the lights are beginning to darken, and while the shades are still very faint—some of the faint ones not even marked. They are then, after clearing, handed over to the portrait painter and coloured over, so that in fact no part of the actinic impression is visible anywhere. The actinic impression simply gives the outline and place of the deeper shades, and serving the painter only as a charcoal sketch. Yet they are sold to the public as "Life Size Photographs!" They are finished either in oil or water colours, or in pastil.

I may finish this communication by stating that for a few months after the nomination of the presidential candidates, life-size maps of their heads, each on a sheet of imperial paper, were at a premium, so that every one who could make such had their hands full of business; but the demand has been nearly supplied, if the number now made is any criterion for judging by.—Yours, &c.

WM. ROSS.

26, *Second Avenue, New York,*
Oct. 16th, 1856.

ANSWERS TO CORRESPONDENTS.

Communications for the Editor *are requested to be sent to* Mr. William Crookes, 15, Stanley-street, Brompton, London, S. W. *Correspondence on the* business *of the Journal to the* Publisher, 16, Canning Place, Liverpool.

G. L.—1. The ordinary printing process on albumenized paper is in most general use, although some high authorities object to the gloss which an albumenized surface presents, and therefore use the plain salted paper.—2. Either the talbotype, waxed paper, or albumen on glass processes are applicable for carrying about in places where you cannot develop on the spot. The *best* process, either positive or negative, is a very vague term, each operator of course thinking his own the best. Our advice is either to look round among the productions of your photographic friends and see which process seems to give the most successful results, and then pay him the compliment of asking further particulars, which, we doubt not, will be willingly given; or to hunt through our former pages and try some of the most popular processes there described, giving preference perhaps to albumenized paper for positives, and the waxed paper process for negatives, several very good descriptions of which are contained in our previous volumes.

Young Photographer.—Powder the bromide or iodide of potassium very fine, and then grind it up for five minutes in a small wedgewood mortar with about eight times its weight of spirits of wine, 60° over proof; pour the milky liquid off into a clean dry test tube, and stand it in a jug of boiling water, taking care that no water runs into the tube. When all is cold, filter it into a clean dry bottle, and it will be a saturated alcoholic solution of the salt employed. We do not recommend the employment of accelerating agents in collodion: have the materials *chemically* pure, and follow some good receipt, and you will not need any accelerating agent.

W. A. H., Alnwick.—Mr. M'Inness' process for transparent positives is described in several of our former numbers, more particularly at vol. I., p. 156.

Lux.—An aqueous solution of gallic acid, contains, at the ordinary temperature, about four grains of acid to the ounce of water. The solubility increases very considerably with the temperature; thus, an ounce of boiling water will dissolve about 120 grains of gallic acid.

Nemo.—Your crystalline appearance over the surface of the collodion plate is caused by not washing sufficiently after the hyposulphite of soda. After a plate has once become covered in the way you name it is lost, as the film is too delicate to admit of a second washing.

Peterborough.—Your collodion has by far too much iodide of ammonium in it: try six grains to the ounce.

Bromide.—The body in combination with the bromide or iodide is of very little effect, except as affecting the solubility. Iodide of cadmium is very soluble in both alcohol and ether, and does not cause the collodion to become red from liberation of iodine. We are inclined to recommend the cadmium salts in preference to any other for making either bromized or iodized collodion.

Glasguensis and H. N. K.—Too late for our present number.—In the next.

Hypo.—You will find what you want at page 8 of our second volume.

N. C. York.—Nitrate of silver bath made by dissolving one ounce of crystallized nitrate of silver, pure and neutral, in two ounces of water; then, with constant stirring, add a solution of four grains of iodide of cadmium in one ounce of water, quarter of an ounce of iodized collodion, and water to make up the volume to ten ounces; allow it to stand for a few hours and filter from the undissolved iodide of silver and precipitated xyloidine.

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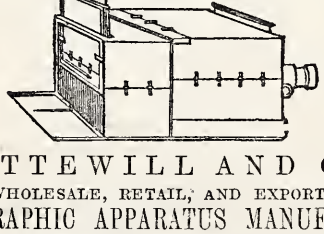

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6½ by 4¾	...½ „ ...	1 8	„	3 5	„	7 9	„	2 6	„
5 by 4	...⅓ „ ...	1 1	„	2 3	„	5 0	„	1 8	„
4¼ by 3¼	...¼ „ ...	0 9	„	1 6	„	3 6	„	1 2	„
3¼ by 2¾	...⅙ „ ...	0 6	„	1 0	„	2 3	„	0 9	„
2½ by 2	...⅛ „ ...	0 3½	„	0 7	„	1 3	„	0 6	„

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Printed by the Proprietor, HENRY GREENWOOD, of No. 14, Fairfield Crescent, in the Parish of West Derby, at his Office, 16, Canning Place, Custom-House, Liverpool.—Feb. 15, 1857.

THE LIVERPOOL & MANCHESTER

Photographic Journal,

EDITED BY WM. CROOKES, ESQ., 15, STANLEY-ST., BROMPTON, LONDON, S.W.

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The

'iverpool & Manchester Photographic Journal.

New Series. No. 5.—MARCH 1, 1857.

his number we have given the promised exts from the paper on Lunar Photography. ontains, besides a description of the mechal arrangements by which the very difficult litions of the problem were so far satisfied leave nothing wanted but corresponding ection and skill in the chemical part, all the ssary formulæ for the preparation of the dion and baths, &c., by means of which any onpossessing the knowledge and accustomed e care required in delicate chemical operamay obtain as rapid and satisfactory re-. We do not, however, promise any results their ordinary average to persons who such a limited knowledge of the art they tice as to fancy that unfailing success is ssarily attendant on a particular formula; ine failures out of ten something nearer is at fault, and the unfortunate solutions nade the scapegoat for the operator's own ilfulness. Such instances as we now allude n only occur among the merest tyros in the and we should have feared insulting our ers by such free expressions of our opinion it not that the very numerous applications h daily come to hand from all parts of the try for "infallible processes," &c., make us ous, Alexander-like, to publicly cut the which we confess our inability to untie. ng as the broad fundamental requirements e art are complied with, there seems to be little difference between one process and er in skilful hands. They are only the used in the art, and while the best tools ot only useless, but really dangerous in ands of children, so it is astonishing how ently the most imperfect appliances can rced to yield successful results when a skilled operator — one who has, so to , honestly served his apprenticeship in rt—brings his long experience and majudgment to bear upon the subject. We mend the above formulæ in the same way we should recommend our own favourite quill—very good and trustworthy, if with discretion, but only *infallible* if the tor himself possesses that qualification. wing the process here given, we have, a compound lens of Ross and in a good taken photographs of persons swingoys playing at leap-frog, a ball thrown up air, and other rapidly moving objects. doubt if much better photographs of our ite can be taken in the way here pursued.

The future of lunar photography lies in another direction. The image must not be received direct on a sensitive plate, and this copy submitted to an after process of magnifying: defects, quite imperceptible to the naked eye on the small negatives, are expanded into great blotches when magnified. The magnifying must be conducted simultaneously with the photographing, either by having the eye-piece on the telescope, or better still, by having a proper arrangement of lenses to throw a magnified image of the moon at once on the collodion. The difficulty of want of light could not be any objection; as, supposing the enlarged image to be equal to those which we have since taken, that would be an increase of area of about twenty times; and consequently 20×6 seconds, or two minutes would represent the average time of exposure—a period which, even were it prolonged four or five times, would not be too severe a tax upon a steady and skilful hand and eye.

We have been favoured by Professor Delamotte with the following particulars respecting the Photographic Department of the Art Treasures Exhibition at Manchester. All contributions of Photographs must be sent in on or before Monday, the 16th of March, and intending contributors should communicate without fail with Professor Delamotte, King's College, London, who will give them such instructions as will enable them to send their Photographs free of carriage to Manchester.

It is recommended, in framing, that a narrow *dead* gold bead frame should be used, with a white mount.

H.R.H. Prince Albert has been pleased to offer a selection from his valuable collection of Photographs.

Accident prevented us from receiving the President's address to the Photographic Society of London in time for insertion in our last Journal; we have great pleasure in now laying before our readers the Chief Baron's very apposite remarks, and *resumé* of the year's progress. Whilst every word that falls from the lips of such a speaker is pregnant with deep meaning, we cannot help drawing attention more particularly to the last paragraph but one, in which the labours of the year are summed up in very few words, but in a most masterly manner.

Mr. Hardwich has communicated to the Journal of the Photographic Society of London a very important paper on the preparation of pure nitrate of silver. As it forms almost a continuation of his former paper on the "Impurities of commercial nitrate of silver," (an abstract of which was given in the second number of our present series), we have inserted the entire paper.

MANCHESTER PHOTOGRAPHIC SOCIETY.—We have been requested to state that the Rev. W. J. Read, who read the paper at the last meeting but one of the Manchester Photographic Society, is not the Rev. J. B. Reade, the discoverer of several new processes, and a member of the Council of the Photographic Society of London. By a typographical error, the former gentleman's initials were put J. B. instead of W. J., in our last number, p. 37. The following are a few errata in the reverend gentleman's paper:—In the first portion, referring to No. 6, H. White should be "Thurston Thompson." Speaking of Mr. Barnes' pictures, "The view from Richmond and Pope's Villa being the finest in the room," read "among" the finest. No. 370 is "Llanthony," not Llanthoris Abbey. The next meeting of this Society will be held on the 4th inst.

The following very curious fact, presenting great analogy to the remarkable experiments of Mr. W. R. Grove, mentioned in a former number, is noticed by M. Phipson, in the *Revue Photographique*:—Several highly polished sheets of glass were piled one on the other and separated by pieces of printed paper. After some time they were found to be marked with the image of the printed letters, in fact to have received a true impression. The moisture about the plates had eventually become condensed on the parts of the glass which were in contact with the dark portions of paper. The image thus produced is hardly visible to the naked eye, even on breathing on the plate; but if such an impressed glass be employed for taking a collodion picture upon, the image produced is crossed with printed lines, the letters being white on a dark ground. This effect has been noticed at M. Pavonet's photographic establishment, at Brussels. The writing on the picture was perfectly legible.

ON FUSED NITRATE OF SILVER.

By MR. HARDWICH.

THE crystallized nitrate of silver may be easily fused in a porcelain capsule placed upon a sand bath and heated by a lamp. During the operation it must be stirred with a glass rod, in order to prevent the portion in contact with the sides being over-heated. There is less danger of producing *nitrite* than might be apprehended, since the temperature at which the salt evolves oxygen is considerably above its melting-point. If, however, the sample of nitrate operated on be impure, or organic matter be present, blackening will take place, and nitrite of silver be formed.

Whilst in the melted state, nitrate of silver has a greenish-yellow colour, but it becomes nearly white on cooling. The aqueous solution restores the blue colour of reddened litmus paper; and this is probably the proper reaction of the pure salt, since it appears to be invariably present, however carefully the process of fusing be performed.

The lunar caustic of commerce often answers the purpose of photography, but as it is prepared roughly for surgical purposes, it cannot be depended on.

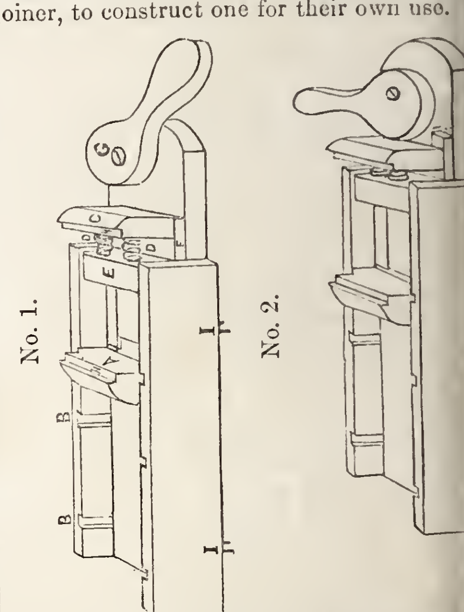
A photographic bath made from properly fused nitrate of silver, will require no addition of carbonate of soda, or of acetate of silver: simple solution in water, with iodide of silver to saturation, will be sufficient. Fogging n[...] not be apprehended; but as the equilibrium [...] a chemically neutral bath is somewhat ea[...] disturbed, a little acid may be dropped in w[...] advantage. For negatives use acetic acid, [...] sixth of a minim of the glacial acid to [...] ounce; and for positives, nitric acid, one-tw[...] tieth of a minim to the ounce.

The exposure in the camera will be much [...] than in the case of the ordinary crystallized [...] trate of silver, and the image will deve[...] more rapidly, and possess a superior intens[...] especially so in the skies of landscapes and [...] white borders of engravings.

If adulteration of fused nitrate of silver [...] suspected, it may be tested for, by adding [...] the solution about one-half its weight of c[...] mon salt, dissolved in water, and collecting [...] precipitated chloride of silver upon a fi[...] Twenty grains of pure nitrate of silver [...] treated should yield a deposit, which, w[...] washed and dried, weighs rather more t[...] sixteen grains and three-quarters.

GLASS CLEANING VICE.

We have been favoured with the follo[...] diagrams of a simple but ingenious little in[...] ment for assisting in cleaning glass pl[...] which has been recently patented in Ame[...] It can be made to suit plates of any size; [...] is, we believe, the best thing we have seen [...] the purpose. The following explanation of [...] diagrams will, we trust, enable any of our fri[...] either themselves or with the assistance [...] joiner, to construct one for their own use.



No. 1. No. 2.

No. 1. represents the vice when open. A [...] moveable slide fitting into the grooves BB. [...] also a moveable piece attached by the spiral s[...] DD to the block E, which is held firm by [...] fixed to the sides; a guide piece F is also affi[...] the bottom of C, which passes under the bl[...] and ensures its retaining a perpendicular p[...] when pressed in by the turning of the le[...] HH are the grooves into which the glass-pl[...] dropped. II are four points for the purp[...] holding the vice firm when pressed down o[...] table or bench. No. 2. represents the positio[...] when the lever G is turned and the plate fixed in th[...]

ERPOOL PHOTOGRAPHIC SOCIETY.

second meeting of the present session was at the Royal Institution, Colquitt-street, on sday evening, February 17th: Mr. COREY, of the vice-presidents, in the chair.

r. BERRY read the following elaborate and ortant paper, which we subjoin at length, *the Chemical, Actinic, and Mechanical irements for the Production of a Satisfactory Collodion Process:"—*

the last meeting, I laid before the members tensive tabular series of the chemical contion of the various organic compounds h have from time to time been employed in ography, and drew attention to the fact that n, hydrogen, oxygen, and sometimes nin, in various proportions, were the whole e elements present in bodies of the most site characters, as lignin, pyroxylin, wax, y, sugar, gallic, pyrogallic, acetic, citric, artaric acids, alcohol, ether, &c., &c. That ltimate chemical formulæ of very many of gave us no data upon which we could ruct a successful process, even theoretically, hat these various compound bodies had rties so characteristic and marked, that we enabled to apply the greater number to ful purpose, with a certain expectation that esired end should be accomplished.

ok the liberty of propounding a series of ions to the meeting, bearing as much as le upon any phenomena observed in the pe and albumen processes, and I would efore you the information thus observed, g more or less upon the elimination of a llodion process, as the points to which the s of photographers are tending in the ng of the present year.

m the investigation of last meeting it l appear—

That calotype paper in all its varieties, xed, could not be kept in an efficient state ny days.

That wax-paper calotype does keep for a longer period under certain circumstances; perience has proved that operators pro- their best negatives on recently pre- paper, and preferably, if possibly, upon which have only become surface dry.

That albumenized glass plates do dete- by keeping, especially in sensibility. r. Ross's paper in last number.)

That the processes which are the least ve in the camera, are, as a general rule, which retain their sensibility longest after reparation.

That as far as the foregoing formulæ have ested, decomposition of the sensitive has been in a great measure independent ospheric influences.

That from the chemical constitution of the nt organic compounds used in the prepa- of photographic preservative processes, tain data could be obtained as guide in arch for a rapid and efficient dry glass s, possessing an approximation to the wet on.

he risk of being somewhat tedious, I will ter into detail upon the examination of organic chemicals employed, and I am the more emboldened so to do as I hope to present them to you in a novel point of view, both as regards their chemical reaction and also their photographic application.

To compress our subject within reasonable limits, I shall consider only the ordinary silver compounds in common use:

Chloride of Silver..	108 Ag	+	36 Cl	= 144
Iodide ,,	108 ,,	+	126 I	= 234
Bromide ,,	108 ,,	+	78 Br	= 186
Fluoride ,,	Comparatively useless.			
Cyanide ,,				

There are two different conditions common among us for the production of photographic images; first, where the sensitive medium is exposed to light until the image is visibly impressed, as in sun printing, and, secondly, by the impression of the latent image to be rendered visible by the after application of a developing, *i. e.* a reducing, agent.

I believe that all the silver preparations are, under favourable circumstances, capable of receiving this latent image, but practice has restricted us to the iodide and bromide especially, or in some instances a combination also of the chloride, as in the modification of calotype.

I now take the three silver compounds before enumerated, and describe the peculiar chemical and actinic properties appertaining to each.

CHLORIDE OF SILVER.—A WHITE POWDER.

If we take nitrate of silver dissolved in water, and also chloride of sodium, barium, or ammonium, or any other soluble chloride, likewise in a state of solution, and bring the two liquids together, by an interchange of elements we shall have as our result a white curdy precipitate, which is chloride of silver, insoluble in nitric or hydrochloric acids, partially soluble in chloride of sodium, very soluble in hyposulphite of soda, and some other salts. If we take chloride of sodium, (pure common salt,) and nitrate of silver, we shall have the following equation:

$AgO.NO_5 + Na\,Cl = Ag\,Cl + NaO.NO^5$: the result of the action being

Chloride of silver, insoluble.
Nitrate of soda, in solution.

Leaving the minute details of its properties to the different works on chemistry, I will only instance the following:—

1. That under all conditions it is discoloured by light, most rapidly in presence of organic matter and a soluble silver salt, but in all cases no amount of washing prevents the blackening action.

BROMIDE OF SILVER. A YELLOWISH-WHITE POWDER,

Produced by an analogous process. Take for example

Bromide of Potassium 118,
Nitrate of Silver 170,

yielding

Bromide of Silver .. .. 186.

In many works of repute on chemistry, the bromide of silver is declared to be insensitive to light, and Fox Talbot originally fixed his camera pictures by wetting with a solution of bromide of potassium. Hunt also in his treatise on light, reports a series of experiments shewing apparently very anomalous results. He employed a primary wash for

paper of bromide of potassium of different strengths, and sensitised with nitrate of silver, also varying in quantity, the strongest solutions frequently being those yielding the slowest results; moreover, in calotype and waxed paper processes, the addition of a bromide to the iodizing solution has been by some considered as an accelerating, by others a retarding agent, and its power of rendering the non-actinic colours disputed. My own experiments have proved to me that bromide of silver, like the chloride, will be discoloured by light in all similar circumstances and with far greater rapidity.

IODIDE OF SILVER. A PALE YELLOW POWDER, Prepared as in the former instances by double decomposition. Solutions of iodide of potassium and nitrate of silver, by mixture yield iodide of silver and nitrate of potash.

Iodide of silver has been unquestionably the most important compound of that metal employed in photography, more especially in the camera processes; its peculiar properties are very definite and distinct from the chloride or bromide. If we pour a small quantity of solution of nitrate of silver into one of iodide of potassium in excess, or, if we soak a piece of paper in a weak solution of nitrate of silver, and then in a strong solution of iodide of potassium, there will be a deposit of yellow iodide of silver on the paper, totally insensitive to light; and iodized paper thus prepared would not yield a latent image. If, on the contrary, we soak the paper in a weak solution of iodide, and then in a strong one of silver, the film will be excessively sensitive, and an exposure for a fraction of a second to sun light would yield an intense black colour on the application of gallic acid.

From the foregoing it has been averred that there are two iodides of silver; one being insensitive. While I would not deny the possibility of the truth of the assertion, I think the following facts go far to invalidate the theory of two iodides.

If we tear the last named paper in two before it has been exposed to light, and float one piece on water once or twice changed, so as to wash away *all* the free nitrate of silver, it will become insensible to light, while the unwashed portion is rapidly impressed; thus proving that pure iodide of silver is unacted upon, and that the presence of a soluble silver salt is requisite to render it available for our use.

This fact was made use of by Fox Talbot in his first publication of his calotype process, in his directions for making iodized paper.

It is requisite at this point to examine the theories extant as to the nature of that mysterious impression produced by light on certain substances, the existence of which is only made known to us by a developing agent, that is, a chemical that has the power of abstracting oxygen from the active sensitive medium, and. as a natural consequence, of depositing metallic s lver on the image.

It has been asserted that the action of light upon chloride of silver paper has been to set free chlorine, and consequently the sun-impressed image is either a di-chloride or a mixture of chloride and metallic silver; and from this it is argued that the impress of the invisible image is a similar reaction to a very infinitesi extent, and that the reducing agent carries on action commenced by light until the impress is developed in all its details and intensity.

The theory of the production of the negat image upon the collodion plate has been t stated. The collodion film presents iodid silver in the most favourable state to rec the negative impression. That the atom iodide of silver prior to the exposure may represented as overlapping each other; that actinism produces a molecular change, not composing the iodide of silver, but predispo it, and, as it were, tending to separate iodide of silver atoms, leaving them united o at their outer edges; the reaction of the py gallic acid on the evolution of the im abstracting oxygen from the water present, hydrogen thus evolved combines with iodine of the iodide of silver, thus reduc the silver to the metallic state.

This theory has been denied by many, with very good reason, from the fact that w the iodide of silver film is copiously washe water previous to the exposure to light, addition of gallic acid produces no discolour except some soluble silver salt be added, apparently proving that the iodide of silv not decomposed, but that the impact of l had imparted some peculiar arrangement o compound molecules which produces suc effect upon a soluble silver salt in presen the developing agent, that the whole vi impression is the result of its decomposi With the iodide of silver alone it is, per impossible to disprove this, but with the bro or chloride no amount of washing render action of the developer, in absence of so silver salt, inert.

I will now apply the results of the abo the dry collodion process.

It is clear that the sole reason why the io collodion film, copiously washed, as in th processes extant, is not totally insensiti light, is the almost insurmountable difficul removing from the compact film all free salts; and that the reason why the dry cesses are so slow is because the great b the active sensitive medium is removed. here the value of a bromide is manifested. abstraction of the surplus silver salt has no ence on its sensibility to even the l luminous emanations; and, by a proper co tion of iodide and bromide in the film, it only possible but practicable to produ collodion plates copiously washed, and fi with gelatine, albumen, or preferably de with a small proportion of honey or sugar with it, and perfectly dried, which sh scarcely less sensitive than the wet col plate in its integrity, and possessing the p ties of perfect preservation, for possibly three months in the hottest season of the yielding all the delicate half tones, owing large proportion of bromide, and develope all the facility of the ordinary collodion ne

I may appeal to many present wheth experimental collodion I have supplied with, has not verified my assertions; an in conclusion, state that the combinat bromide and iodide I have found most se

ıas been two equivalents of bromide to one of odide, using a porous pyroxyline, with a maximum amount of alcohol in proportion to the ther employed, and that the haloid salts present hall not be less than six or seven grains per unce of collodion.*

The CHAIRMAN exhibited a picture contributed y Mr. Ross, of New York, taken by his Scioptric amera. The description accompanying the icture, detailing the value of the camera, its use nd mode of application, was also read, and which e append in full, in order that our readers ay be enabled to form some idea of its peculiar ropertics:—

"The lens is of $3\frac{1}{4}$ inches focus, and the plate overed is 8 inches by 3 inches, being as much s could be covered by the same lens in an rdinary camera at four several times, at all vents more than three times.

"It is, as you may observe, from a back garret indow, where you may see down some of the ear chimneys. The black portion near the top ke the sail of a ship is the rectangular window-utter, which is hung by the top and propped by a stick, also seen black on the left. Its urious shape is caused by being too near the ns, and obstructs so much of the sky by which s outline is given, and not by being itself de-cted by the lens. The church on the right is very dark red bricks, as are indeed all the ildings, though one or two of them have en painted of a lighter colour. It may be lled an instantaneous impression, although it ok from 12 to 14 seconds to finish the whole, only about a quarter of an inch was im-essed at once, the peculiar diaphragm having sliding aperture which permitted only that rtion to be acted on, as you may discover the dth of the aperture in two places on the urch, where the motion was quicker than on e other portions, leaving them rather darker an the rest. This is the fourth plate that er was impressed in it, and I think that as on as the proper experience is had, I may rly venture out of doors with it. Only think the whole visible world being pourtrayed on ee plates of glass of this size. This specimen ludes precisely 120°, or one-third of the entire rizon. Its defects of execution you know can sily be remedied by more careful manipula-n, and you will readily conceive that not only ıld a regiment of soldiers be taken in line, t that the whole visible portion of a field of tle could be brought at once into the general's t, or the greater part of siege works could be ught at once before a council of war, and the ns of attack as well discussed there as if ex-ed on the field itself.

Of course a camera on a larger scale would be ter, but for many purposes this will be suffi-nt, as if larger pictures are required, the im-ssions could be enlarged by the megascopic nera to any required size. Another more peaceful use might be made of this arrangement, in taking views of harbours from the direction in which they would be approached by mariners, so that the particular place would be at once recognised, which, from the sketches now used on charts, &c., for this purpose, is not always the case with a shipmaster who seeks the port for the first time. An additional feature would be in the exhibition of panoramic pictures of various localities, taken in this kind of camera. These could be exhibited and enlarged from the glasses themselves by a scioptric magic lanthorn, and thus save the great expense of painting them on cylindrical walls, or on a great expanse of canvass, as the same canvass or the same walls will receive any number of different scenes, according as the impressed glasses may be changed. The only addition required to be made to the camera would be a moveable light behind the aperture of the scioptric box.

"My larger scioptric camera has a lens of six and a-half inches focus, which requires plates of 14 by 5 inches, and is sufficiently large for any ordinary purpose. No large box is required for either of these cameras, except that used for packing the materials, &c. in, for convenience of carriage, and this is common to all cameras.

"The box of the large camera is ten inches high, five inches from lens to back, and two inches wide, and this width is only necessary to screw the lens tube to, as one inch would otherwise be enough. This can hardly be called a box, as it is a solid piece of wood having a mortice through it.

"It has engaged much of my leisure time since 1850, and the first attempts were inclosed in a large box, with very complex machinery; but after many improvements it has been so simplified as to require no box, while an ordinary camera must have a comparatively large chamber, because the whole surface of the tablet has to be impressed at once.

"It may be asked, why not include 180°, or a complete semi-circle? But this has a mechanical limit, because the lens occupies some space, and must be supported in some way: consequently, as the whole horizon cannot be obtained on *two* plates, it would be no advantage to include more than 120° on any one plate; because, if so, a third plate would still be necessary, which would only be a fraction of the length of the others.

"I have, therefore, limited the field to one-third of the horizon, so that each of the three plates may have an equal portion on it, and this is 120°.

"In spring, before the foliage is fully expanded, I expect to be able to send you something better worth looking at than down any chimney. You will then be able better to see what it can do in the field. New York City, from the deck of the Cunard Steamers will probably be the first I will send you. I presume you are aware that they lay in the adjoining State of New Jersey, (not at St. Brelade's Bay in Old Jersey,) on the opposite side of the Hudson.

The CHAIRMAN then alluded to the valuable and interesting experiments of M. Poitevin in photo-lithography, a report on whose process, by the committee appointed to investigate it, appeared in the February number of the French

* We have long used collodion, for dry processes, prepared the following formula:—

Iodide of Cadmium	3	grains.
Bromide of Cadmium	4	„
Soluble Paper	5	„
Alcohol	3	drachms.
Ether	5	„

calculation, we find that if the bromide of cadmium be in-cre sed to $4\frac{1}{2}$ grains, the conditions recommended by Mr. Berry w be almost exactly fulfilled —ED. L. & M. P. J.

Photographic Society's Journal, *Bulletin de la Société Française de Photographie.* Commenting on this report, Mr. Corey alluded to the use of bitumen of Judea, and the various soluble bodies of vegetable origin, gum, dextrine, gelatine, &c., employed in lithographic engraving, and to the superiority of albumen, as demonstrated in M. Poitevin's process. He then read the formula published in the report, which we annex:—

The lithographic stone is covered with a solution of albumen and bichromate of potass. It is then exposed to light, under a negative, as in ordinary printing, the light producing, conjointly with the chromic acid, a change in the nature of the albumen surface in the ratio of its action. The light transmitted through the more transparent parts of the negative, imparting in the degree of its intensity to the albumen a water-repellant property of the greatest advantage in, or rather necessary to, the lithographic process. In this altered condition of the albumen, differing from coagulation, it is easily charged with ordinary lithographic inks, which do not adhere to the parts unacted on by light. Over this a roller is then passed, covered with another ink into the composition of which soap largely enters, which, adhering to those parts of the impression on which the light has acted most intensely, viz., those which have become water repellant, the image is traced in the two media of soap and grease in the conditions necessary to the lithographic process.

LONDON PHOTOGRAPHIC SOCIETY.

We now subjoin a report of the President's address, delivered at the annual meeting of the above society, on the 5th ult., the insertion of which in our last number was prevented by an unfortunate accident:—

Gentlemen,—On this, our anniversary meeting, I desire to say a very few words to you before the ordinary business of the Society commences. The Report which will be presented to your attention from the Council, renders it unnecessary that I should do more than make a very few observations, but I cannot abstain from congratulating the Society upon the increased prospects of success which surround it, and which present themselves in every possible way in which the prosperity of a society can be ascertained. The increase of members is very much more than took place during the preceding year. The number of copies of the *Journal* disposed of, and the benefit arising to the Society from their distribution, is much more than during the former year; and it is very satisfactory to learn that the actual funds in the possession of the Society are considerably more than when the banker's account was examined for the year preceding. Various circumstances have occurred which indicate that not only this Society, but Photography in general, has received, what I think it deserves, a large encouragement in all ways from the public; and I may mention as a specimen of the success of the Society, the assembly which took place a few months ago, which was eminently successful—for you had a large number of visitors of all ranks, including persons interested in scientific pursuits of every description.

It is very gratifying to know that the Exhibition of the present year has received the same attention as hitherto from the Patrons of the Society. Her Majesty was not present, but Prince Albert, the Prince of Wales, and other members of the Royal family attended, and expressed their entire satisfaction with the improving and improved progress the Society appeared to have made in works of Art. The number of pictures exhibited is larger, and I think I may appeal to the gentlemen present who have seen that Exhibition, whether it is not successful in an eminent degree as showing striking progress in Photographic works of Art. The success of that exhibition is manifest in the improved funds of the Society as derived from it.

The *Journal*, as those who have read it are quite aware, contains many valuable papers read before the Society, though perhaps there are none of them that exhibit any striking novelty in the art or science of Photography; but there are a number which contain many fresh facts, and which suggest new modes of proceeding in the preservation of those specimens of the Art which have hitherto been made.

I cannot avoid noticing, too, one fact which has struck my own mind. I believe few persons are unaware that, by the combination of photography and the electrotype process, curious and very interesting subjects are presented to the public, by which the art of engraving is, in some measure, superseded by photographic efforts combined with the electro-battery; I dare say there are few members present who are not more familiar with it than I am myself from the paper by Mons. Pretsch, read before the Society during the past session. I do not speak now to give any particular praise to any one; I do not pretend to assign the original invention to its true author; but I am speaking of the results I have seen (although I have not seen the process), and I am speaking of it merely as a matter of fact presented to my attention for the first time. It is discovered that gelatine treated by a certain process, and exposed to the light, has the thickness of its surface so affected that if you could convert the substance at once into a plate of copper in its then form, it would be practicable to print from it upon paper. As this is not the case, a cast of it is taken by gutta percha, and then, by the electrotype process, the cast of gutta percha is taken on copper, and thus you get on copper that which is a substitute for the original substance. There is no doubt some assistance is necessary from the engraver, but with very little help from a skilful artist you can obtain a copper-plate, perfectly efficient for printing from, though more limited in the number of engravings than ordinary copper. Of course the copper is in its purest and therefore in a soft state; but *commercially* the effect of it is, that you can produce an engraving having all the spirit and character of the original. Whether it be a scene in nature, whether it be a picture, whether it be a collection of objects grouped together,—it gives the most perfect form, equal to the finest engraving in copper, and at, commercially speaking, a much cheaper rate. The effect of this is to present photography as contributing to the immediate wants of a large body of persons in a variety of

ways far beyond what has hitherto, I believe, been offered to the public.

It has often occurred to me to recommend to the Society—and whenever it is located with a degree of certainty, I hope it will carry out the suggestion,—to collect specimens of the best pictures from the best cabinets in Europe, and thus give examples which would be most interesting, of those great collections of the highest works of art. Pictures, statuary, everything that interests mankind in that department, might then be collected into a comparatively small room, as reminiscences of everything that is great in art, that is noble and magnificent in genius; as either painting or statuary might be brought into a very small compass, so that persons might form some idea of them, and without travelling beyond the boundaries of England, might become acquainted with works of art all over the world. So not merely by looking at copies by engraving, of which, however, I wish to speak always with great respect, they would see them then with that transfused genius which it appears to me photography never fails to convey. No doubt, though often eminently successful, it sometimes fails with respect to copying the human countenance; but for the purpose of taking a landscape under favourable circumstances, and for the purpose of copying a picture, I think it is not too much to say that photography can transfer from the original on to paper, whatever genius can invent, or nature produce, worthy of imitation.

Gentlemen, I certainly expressed the hope last year that our pursuits would be ancillary to the extension of a very high class of philosophical facts. I think so still. I think there are intimations in all parts of the Journal of experiments that elucidate what may be called the history of the effects of light and of electricity upon various matters. The Journal, I admit, for the present year, contains rather facts than science. I need not, I am sure, remind the gentlemen whom I have the honour to address, that knowledge is the collection of facts—science is the collection of laws. We have rather been employed this year in collecting facts, than in illustrating those facts by the discovery of their laws. I may, however, say, it was but at the last meeting at which we were assembled, that Mr. Babbage brought to bear upon the subject the resources of his enterprising genius and extended knowledge of science, and he submitted a series of questions,* for the consideration of photographers, the object of which was to develope the laws by which colour is in certain cases rendered by light. I continue to hope that not only will photography have conferred upon mankind the benefit of perpetuating whatever any one is pleased to think worthy of being placed on paper, and recording as it is, but that it will be the means, just as the use of the microscope has shed such light and lustre upon physiological and botanical researches, of communicating to the world a better acquaintance with the action of light and electricity in a variety of forms, of which we at present scarcely dream.

Gentlemen, my name is presented to your attention as President of the Society. I feel deeply the honour that you have conferred upon me by electing me president, but I beg to say most sincerely, that though I feel proud of that honour, and am happy to contribute as far as I can to the advancement of the society, yet, whenever its interests require that you should be presided over by a person more worthy to fill the place I now have the honour to hold, I am quite ready to resign the position to any one who may render you more service than it is in my power to do.

* These will be found in full at page 16 of the present Vol.

THE POSITIVE COLLODION PROCESS.*

By Mr. L. McLachlan.

In laying before you the experience I have acquired in the practice of photography, I am sensible that much indulgence will be required on your part towards me, as it is a subject that has been so often treated by much abler men than myself.

At one time I believed it impossible to obtain a good picture if the wind was in what I considered the wrong direction; at another time, I believed that my collodion could not possibly be worked by any other man with success, neither could I obtain any that I could work with, and at last I gave up all idea of ever finding collodion, silver bath, developing solution, &c. that would take pictures by themselves, without using proper discretion in working them: I therefore began to reason with myself as to the cause of all my failures, and the mind did its work as it will ever do, if applied with proper assiduity.

To begin operations, I procure the patent plate glass, which in my opinion is the best; obtain a *porcelain dish* sufficiently large to hold the plate that is to be cleaned, also another of convenient size to contain the requisite number of plates. Into the first put two ounces of water, one drachm of nitric acid, and two drachms of liquid ammonia,† and procure a piece of flannel, with which well rub the glasses in the first dish until all greasiness is gone; then place them in the second dish. After having cleaned as many as you require, take one by one out and hold it under a stream of running water, to clear away every trace of the acid mixture—(I myself employ a filter for that purpose)—then well rub with clean cotton cloths. I find cotton cloths that have been much in use, and well washed in soda, to answer better than any other material. After the glasses are well dried, place them in boxes ready for use. The cloths must be *scrupulously clean*, otherwise nothing but failures will ensue, however well prepared your chemicals may be. I will undertake to say, that glasses cleaned in the manner described will be *chemically clean*,

* Read before the members of the Manchester Photographic Society at their monthly meeting, Feb. 6th, 1857.

† It is only after having received a written assurance from the author that the above is really what he means, and feeling that we are not justified in altering the authors' meaning in papers read before any society, that we have allowed this chemical error to stand. Both acids and alkalies exert very powerful, but totally opposite, actions on the various substances likely to be present, as *dirt*, on the surface of a glass plate. Nitric acid and ammonia are each energetic members, the former of the class *acid*, and the latter *alkali*; and are recommended by several most experienced operators to be used *consecutively*, (either with or without a purely mechanical agent, e.g. tripoli,) for the more perfect removal of extraneous matter. The author, by mixing the two together, *neutralizes* their detergent properties, and consequently cleans the plates in a solution of the perfectly inactive result—nitrate of ammonia.—Ed. L. & M. P. J.

and do not know of any other method ensuring the same success, if even we take three times the trouble with them that is required by this process. Tripoli is not near so good; ammonia by itself will not do; no, nor even when nitric acid is used after, have we the same clean glass. I have never any failures occur through dirty glasses. The cloths for cleaning glasses should be kept in a box by themselves. To give the glass the last polish, lay it on a table with a perfectly clean cloth underneath, then breathe well all over the glass, and with an old silk handkerchief rub until every mark entirely disappears; dust off any nap that may come from the handkerchief with a fine broad camel-hair pencil; it is then ready for coating with collodion.

Take the plate between the fore-finger and thumb of the left hand, and with the right pour on the collodion in sufficient quantity to cover half of the plate, and, without allowing it to rest, tilt it gently to the left hand corner, from the fore-finger and thumb to the right, and back again to the corner it is held by, finally pouring off at the right hand corner that is nearest to you; but whilst pouring off the plate must be worked from right to left, so as to cause the lines to collapse perfectly. After having allowed a few seconds for the ether to evaporate, place it on the dipper, and gently lower it into the silver bath. I never take out the plate until it is perfectly excited, which is easily known by the complete absence of all streaks. I would not advise the plate to be kept in the bath for any longer time than is absolutely necessary, as I believe it injures to some extent the development of the picture, more particularly with some collodion than others.

I prefer collodion that has an oily appearance when poured on the plate, and does not set sooner than in about *ten* or *twelve* seconds in winter, and *two* or *three* in summer. If when drying it has a veiled appearance, the results will never be so good, the pictures seeming flat and misty looking. Collodion for positives I prefer containing a good quantity of free iodine; and should it not possess any, it may be added by taking resublimed iodine and dissolving it in spirits of wine, then adding drop by drop until the collodion assumes a deep orange color; by so doing I obtain much better half tones in my pictures. If persons prefer preparing their own collodion, the following formula I have found to give as good results as any I have tried:—

Purified Ether sp. gr. ·720... 5 drms.
Alcohol sp. gr. ·832 .... 2 drms.
Soluble Cotton.................. 5 grains.

To which is added 1 drachm of the following iodizing solution:—

Alcohol sp. gr. ·832......... 8 drms.
Iodide of Cadmium .... 16 grains.
Bromide of Potassium ...... 4 grains.

Shake well together and allow to stand for a few days. I seldom find collodion to work well when newly prepared.

The bath I prepare as follows:—To 1 oz. of distilled water add 35 grains of nitrate of silver, and after deciding upon the number of ounces to be used, coat as large a plate as the bath will allow with collodion, and let it remain in the bath until the silver has deprived it of all the iodide it contained: repeat the operation until the bath is saturated, which may be easily ascertained by the last plate remaining in the bath unaffected. I prefer this mode of saturating the bath when positive pictures are wanted, in preference to saturating it at once with iodide of potassium. I believe better whites are obtained by this method. After having taken out the last plate filter for use. It should have a *decided acid reaction* to test paper. Nitric acid, although it retards the action of the light to a much greater extent than glacial acetic acid, also gives better whites. The bath must be kept carefully excluded from the light, or decomposition will ensue, the pictures appearing foggy when developed. In filtering silver baths, very great care should be taken in the selection of the filtering paper, some samples containing matter soluble in nitric acid; the safest plan is to place the filtering paper in the funnel, and wash it out with distilled water. I object to the filtering of silver baths, and therefore never resort to it, unless there are particles in suspension that will not settle to the bottom. I always make double the quantity required, and, allowing it to settle, pour off the clear portion for use. I keep by me a solution of 40 grains of nitrate of silver to the ounce of distilled water, which I occasionally add to the bath that the strength may be kept up, for after having worked the bath for some time it becomes considerably weaker, especially in winter, as the loss of water by evaporation is not near so great as in summer time. To keep the silver bath in good working order requires some little attention paying to it at intervals; for although we may begin with our materials in first-rate working order they will not keep long as they were originally. Every chemical we use is continually undergoing some change, and although it is very slight, it makes a wonderful difference in the quality of the picture. In fact it is only by very careful attention to trifling changes that are constantly taking place, that we can keep our materials in good working order. It is no use blaming the collodion, bath, &c. when things go wrong, nor coming to the conclusion that pictures cannot be taken because the weather is not so good as it might be. Truly we should have to modify the method of manipulating at times, to meet the atmospheric changes, density of light, damp, &c. I have here two pictures that were taken in the worst possible weather, about a month ago, the one negative and the other positive, and I think they may be considered as fair specimens of photography; yet the same chemicals in other hands produced nothing but failures; the same collodion being used for both pictures, the only difference made in the material was to slightly increase the strength of the developer, without adding any nitric acid in proportion. I also added a few drops of the silver bath to th developer, and quickly threw it over the plat: before I used the means described, the picturs came out thin and silvery, also developing vey unevenly.

In developing positive pictures in particuar, the hands should never be allowed to tuch any part of the plate but the corner it is fted out of the dark slide by to develop; some ands

being so warm, that if allowed to come in contact with the back of the plate, they will cause an uneven reduction. I pour the developer on quickly, but not with such great force as to cause the silver to be washed away on the part it is poured on at. I use a wide-mouthed bottle both for the developing and fixing solutions.

The tone of your pictures is constantly liable to change from different intensity of light acting upon the plate, with the same amount of acid always present in the film. Here let me say a word or two about the arrangement of the light. From the pictures that we generally see it seems a matter of minor importance; whereas it is, in reality, the cause of more than half the bad pictures that are seen. I am myself in the habit of taking very great pains, never considering that my time is thrown away, if it should take me more than ten minutes to arrange in such a manner that it may fall softly, and allow of all the natural shadows that are in the face being retained. I then try for what I see upon the focussing screen, and should I fail, I know for a certainty that the plate is either under or over-exposed, or it may be badly developed; but if the light has not been well arranged, you cannot tell near so well the cause of your failures. To develop the picture I do not use protonitrate of iron exactly, but a developer something akin to it. I prepare it as follows: procure a bottle that will contain 8 ounces, weigh out exactly 90 grains of protosulphate of iron, which you must crush well, but not to an impalpable powder, place it in the bottle, then add to it exactly one ounce of water; immediately before any of the iron is dissolved drop in 20 drops of nitric acid, and instantly shake until all the iron is dissolved; it should now be of a lemon colour; if the colour be a deep yellow, the iron may have been a bad sample, or the nitric acid particularly strong. After you have obtained the exact colour described, add five ounces more water, which should just leave the solution colourless, or nearly so; then add six drachms of spirits of wine, to cause it to flow easily over the plate. Everything depends upon the exact preparation of this developer; for if the acid be added in too great quantity; or in such a manner as to destroy the iron too fast, and cause it to blacken, it will not develop at all. The tone of the pictures produced by it are what would be called pure photographs, and are not so fit for colouring with powder colours; but it may be modified to produce any tone by adding only 15 drops of nitric acid and 6 or 7 of glacial acetic. This developer I have now worked with fully four years, and is a preparation of my own, having cost me many hundred experiments in developers with different proportions, before I decided upon it as the best for constant use. If your material is at all in order, you will get with it a perfect white after all others have failed. There is no part of the collodion process where such nicety of judgment is wanted as in the development. True, we must have a good foundation to work upon; but more may be made with bad collodion skillfully managed, than with a good one that is not understood. I prepare, for the method that I have described, a creamy and opaque one, if the collodion does not contain more than three or four grains of cotton to the ounce, and is not at all inclined to be glutinous.

The fixing solution should clear the plate in about three-fourths of a minute. If it is too strong it is liable to injure the blacks.

The causes of spots and streaks which are sometimes met with on the plate, may be, that the collodion is over iodized, and the bath weak, which would precipitate iodide of silver in the bath, and so cause black spots; the streaks are caused by the mechanical structure of the film being destroyed. Filter your bath and add a portion of your 40 grain solution; it may also be necessary to add to your collodion about one drachm to the ounce of uniodised collodion. Sometimes your pictures will come out quick, leaving the blacks behind; your bath is too acid foı your collodion. There may also be too much acid in your developer. But more likely than any other thing, the developer is too strong, and must be weakened. There are many other failures that the collodion operator is liable to, but to enter into them in a manner that would be of any service to the novice in the art, would require a much more lengthened description. With a little reflection on the nature of the photographic image, and the means employed to produce it, our difficulties will not be very great, nor their duration very long.

ON THE PHOTOGRAPHY OF THE MOON.*

By William Crookes.

It was my good fortune in the autumn of the year 1855 to obtain several excellent photographs of the moon by means of the fine equatorial at the Liverpool Observatory. This, together with all the resources of the establishment were placed at my disposal by my kind friend Mr. Hartnup, to whom it is but due to state, that were it not for the invaluable assistance afforded by his sterling advice and steady hand, the results would not have been worth keeping.

A short account of the instrument and its unique mounting will form an appropriate, and I doubt not, interesting prelude to the photographic process. The polar axis and telescope together weigh about 5 tons, and whilst all parts are so truly and smoothly fitted that this enormous mass is moved equatorially by means of a small water-mill with such marvellous accuracy, that a star viewed through it appears absolutely stationary, its firmness is such that a hard blow against the side merely produces a scarcely perceptible momentary deflection. The object glass is 8 inches diameter, and has a sidereal focus of 12·5 feet—the diameter of the moon's image in this focus being about 1·35 inches.

The eye-piece was removed, and in its place the body of a small camera was attached, so that the moon's image would fall on the ground glass or sensitive film in the usual manner. Much labour had been saved me in finding the true actinic focus, by several gentlemen at Liverpool, who were working for some time on the same subject when the British Association met in that city in 1854. They found that the object glass had been over corrected for the actinic

*Abstract of a paper read at the Royal Society, Feb. 12th, 1857.

rays—the plate being required to be placed at a distance of 0·8 of an inch beyond the optical focus: a few experiments were sufficient to enable me to verify this result.

During the time above referred to Mr. Hartnup had taken many hundreds of pictures with chemicals recommended by various persons, but had not succeeded in obtaining a good negative at all, and not even a positive with a less exposure than from 30 to 60 seconds. As I succeeded in obtaining dense negatives in about 4 seconds with the temperature below freezing and the moon at a considerable distance from the meridian, and as I attribute the greater sensitiveness which I obtained to the great purity and good quality of the materials which I employed,—I think it will be of interest to all photographers if I describe accurately and fully the whole photographic process; previous to which, however, the mechanical arrangements will be explained.

The clockwork movement was only sufficient to follow the moon approximately when on the meridian, but as the pictures were nearly all taken when the moon was some distance past the meridian, and when consequently the declination and atmospheric refraction were changing rapidly, it was necessary, notwithstanding the short time required to take the pictures, to correct for the imperfect motion of the telescope. This was done by means of slow motion screws attached to the right ascension and declination circles, which are each 4 feet diameter. The *finder* had an eyepiece of a power of 200 applied to it having crosswires in its field.

The *modus operandi* of taking the picture was as follows:—The telescope having been moved until the moon's image was in the centre of the focussing glass, the water-mill was turned on and the dark slide containing the sensitive collodion plate was substituted for the ground glass. Mr. Hartnup then took his station at the finder, and, with a tangent rod in each hand, by a steady and continuous movement kept the point of intersection of the cross wires stationary on one spot of the moon's surface. When the motion was most perfectly neutralized I uncovered the sensitive plate at a given signal and exposed it, counting the seconds by means of a loud ticking chronometer by my side. From the ease with which on my first attempt I could keep the crosswires in the finder fixed on one point of the moon by means of the tangent rods, I confidently believe that with the well-tutored hands and consummate skill which guided this noble instrument, the moon's image was as motionless on the collodion film as it could have been were it a terrestrial object.

Description of the Photographic Process.

The glass employed for taking the lunar negatives was that known as extra white colour patent plate; the operation of cleaning the surface, which is one of especial importance, was effected in the following manner:—

The glasses were dipped into and then well rubbed over with a hot solution of caustic potassa; then after washing with water they were transferred to hot nitric acid (1 part of strong acid to 3 of water) where they were allowed to remain for about half an hour.

A piece of soft wash leather was plentifully rinsed, first in a warm dilute solution of carbonate of soda, and afterwards in clean water, and then well wrung until all the superfluous water was removed. The glass plates were taken from the nitric acid and rinsed in abundance of clean water and then rubbed well on every part with the damp leather. This removed most of the superficial moisture, and the final drying was effected by means of another piece of wash leather prepared in a similar way but allowed to become perfectly dry. Just previous to being used the plates, held in a pneumatic plate holder, had the last polish given to them by briskly rubbing with a warm piece of fine diaper (which had also been previously washed in soda and water and then well rinsed and dried) until the moisture condensed from the breath evaporated evenly and uniformly, especially guarding against the slightest contact between the surface of the glass and the fingers.

The plate was now held with its clean side downwards until the collodion was about to be poured on, and every particle of dust, which was easily seen by bringing the source of light, the under surface of the plate, and the eye, nearly in the same line, was gently wiped off by passing a warm piece of fine cambric lightly across. Care was also taken to have the atmosphere of the room as free as possible from floating particles, and the dried collodion usually adhering to the neck of the bottle was scrupulously removed.

The collodion was poured on and the plate rendered sensitive in the usual manner. As the temperature both of the equatorial and operating rooms was seldom far from the freezing point, the great diminution of sensitiveness which that circumstance would have occasioned, was obviated by having the nitrate of silver bath and the developing solution warmed to about 80° Fahr., and also by slightly warming the plates before using. The source of light was a fishtail gas burner in the outer room and shining close to the orange glass window of the dark room.

The operations of developing and fixing were conducted in the usual manner, no particular precations, save such as would suggest themselves to any careful manipulator, being taken. After fixing, the pictures were well and carefully washed in warm water, dried before a fire, and after scratching the description or name on a corner, varnished.

The negatives which I thus obtained were exquisitely beautiful, and so minute that I could not obtain paper with a sufficiently fine surface whereon to print copies which would do them justice. It was evident that they would bear magnifying several diameters and still remain sharply defined. To effect this, a half-plate combination of lenses, by Ross, was screwed the reverse way into a large sliding camera body, 10 inches high and 11 inches wide, and capable of sliding from 18 inches to 3 feet in length. At the end, opposite to the lens, was a groove, to admit of a focussing glass, or dark slide, for the sensitive plate. A smaller camera body was screwed on to the other end of the brass work, having at the end opposite to the lens a sliding box, to hold the small negatives

of the moon. A reflector was placed in front of all, and so arranged as to be capable of moving in altitude on a hinge at the lower part, and thus reflect the diffused light of the sky through the negative and lens, parallel to the axis of the latter.

Preliminary trials showed me that there was no use in magnifying the small pictures more than twenty times, as beyond this the individual parts began to get confused and indistinct. This magnifying cannot, however, be effected at once: in the small negatives the lights and shades are the reverse of what they are in nature, consequently a print on paper therefrom gives the light and shade correct. A photographic copy of a negative, however, produces a positive by transmitted light, and a print from this would have the shadows light, and the light parts dark. Consequently, in magnifying a negative to produce still a negative, an intermediate transmitted positive must first be taken, and this in its turn magnified, when it will give a negative.

The relative distances between the small negative, the lens, and focussing glass, were so adjusted that an image of the former, enlarged to about two diameters, was thrown upon the latter, care being taken that the light from the sky was reflected parallel through the centres of the negative and lens by means of the mirror. The aperture of the lens was then stopped down to about half an inch by means of a diaphragm, and the focus most carefully obtained by sliding the body of the large camera in or out. It was found necessary to verify this by experimental trials at different short distances, on each side of the observed focus, as it was difficult to judge accurately with the eye on the ground glass, owing to the roughness of the latter and the feebleness of the light.

A picture, or rather many pictures, were now taken, and the one which by transmitted light most truthfully resembled a paper print from the small negatives, was reserved for further magnifying.

This was effected absolutely in the same manner as the former. The negative being removed, and the positive being placed in its stead, a further magnifying gave a large-sized negative.

Although this process seems very simple, it is impossible to estimate the difficulties which I had to overcome before arriving at the beautiful results which I laid before the Society. The double copying had a tendency to slightly exaggerate the light and shade, and this could only be obviated by exposing the plates for such a time that, with the feeble light at my command, it was verging on decomposition. Particles of dust, too, seemed most pertinaciously to fix themselves upon the prominent mountains, giving rise to craters where none should be; and even my finished pictures are not perfectly free from these faults, although each negative is the representative of upwards of a hundred failures and a month's work.

PREPARATION OF THE MATERIALS USED.

The soluble paper for the collodion was prepared in the following manner:—A mixture was made of

	sp. gr.	
Nitrous Acid of commerce	1·43	4 fluid ounces
Nitric acid	1·37	4 ,, ,,
Sulphuric acid...............	1·82	8 ,, ,,

When the temperature of the mixture had cooled down to 120° Fahr., one sheet of Swedish filtering paper torn up into small pieces was completely immersed in the mixture, and allowed to remain therein for about half an hour. It was then thrown into a large pail of water, and the paper removed and placed on a sieve under a running tap for about 10 minutes. It was then washed in very weak solution of ammonia and afterwards in plenty of water and allowed to dry spontaneously in the air.

The collodion was made with—

Ether sp. gr. 0·725 (previously freed from acid by rectification from dry caustic potassa).....	5 fluid ounces.
Absolute alcohol	3 ,, ,,
Soluble paper, dried at 212° Fahr.	50 grains.
Pure iodide of cadmium.........	30 ,,

The alcohol and ether were mixed together, and then the paper and iodide of cadmium added, they dissolved in a few minutes with a little shaking. As soon as the solution was complete it was allowed to stand for 24 hours, and then half of the clear supernatant fluid was carefully decanted into a clean, well-stoppered bottle for use.

The nitrate of silver bath was made by dissolving 1 ounce of crystallized nitrate of silver, perfectly pure and neutral, in 2 ounces of water, then, with constant stirring, adding a solution of 4 grains of iodide of cadmium in 1 ounce of water, and a quarter of an ounce of the above iodized collodion, and then water to make up the volume to 10 ounces. This was allowed to stand for a few hours at a temperature of 80° Fahr., and then filtered from the undissolved iodide of silver and precipitated paper. A glass bath was used in preference to gutta percha, and as above stated it was heated to 80° Fahr. when used.

The developing solution consisted of—

Pure pyrogallic acid	8 grains
Crystallized citric acid	16 ,,
Water	8 fluid ounces
Alcohol	½ ,,

This developing solution is very slow in its action, 15 or 20 minutes being frequently required, but it ultimately produces negatives of great vigour and freedom from stains.

The fixing solution employed was the ordinary nearly saturated solution of hyposulphite of soda: and the pictures were varnished with the usual solution of amber in chloroform.

Mr. T. A. Malone, who last year delivered a course of lectures upon Photography, at the Royal Institution of Great Britain, on the 13th ult., gave a "Friday Evening" on "Photogalvanography, or the Application of Light and Electricity to the Production of Engravings." We have only at present the opportunity of saying that the subject created considerable interest, and was illustrated by many beautiful specimens of photo-galvanography and photography. Amongst the latter we

feel justified in specially mentioning the photographs and stereoscopic pictures exhibited by Messrs. Murray and Heath, of Piccadilly: the latter including many of the beautiful subjects which this firm sent to Dr. Tyndall's "Evening" on the "Glaciers."

CORRESPONDENCE.

NEW PRESERVATIVE PROCESS.

To the Editor of the Liverpool and Manchester Photographic Journal.

Dear Sir,—While making experiments in pursuit of a particular object, others are frequently discovered, and ofttimes of greater value than the one sought for. Making experiments some time since, I discovered a process for keeping collodion plates sensitive for a lengthened period of time, without extra trouble or loss of sensitiveness, the great drawback to preserved plates; the process is of the most simple kind and briefly described.

The plate is coated and sensitized in the ordinary manner, and after removal from the nitrate bath, the plate is immersed in a prepared* plate-box filled with distilled water; an indefinite number of plates may thus be prepared, and when required for use, taken out and drained in the usual way as if fresh from the nitrate bath; expose as usual, and the same time as a fresh plate.

To develope the picture, first pour on a solution of nitrate of silver, 15 grs. to the ounce, and then develope in the usual manner.

I have kept plates for ten days in this manner, and have not found the slightest difference in the results, and believe they may be kept an indefinite period if required. I need scarcely remark that every precaution must be taken in cleaning the plates, keeping them from every ray of light, &c.

I find this process of great assistance to me, and as photographers will soon be stirring out of doors, I trust it will be as useful to them as it is to me. I may remark, that a simple and very excellent contrivance, described by Mr. Long in '*Photographic Notes*,' No. 20, is admirably adapted to this process out of doors.

I shall be happy to give further information, if required, to any person.—Truly yours,

HORATIO N. KING.

42, *Milsom-street, Bath, Feb.* 9, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Permit me to ask Mr. Merritt, through the medium of the *Liverpool and Manchester Photographic Journal*, two or three questions on the subject of his method of preparing preserved collodion plates, which appeared in your last number.

To be more available for out-door work, we want a *dry collodion* process. The film ought to be perfectly dry when ready for exposure. Mr. Merritt having been, as he says, so successful with loaf sugar solution in preserving his plates, I would like to know whether, after they have been prepared a few days, the film is moist or dry?

Have the plates to be rendered sensitive with an acid, or neutral bath?

Will good ordinary negative collodion do for the process?

* A gutta percha plate-box can easily be made, or any common wooden one can be made waterproof by being coated with a solution of gutta percha, dissolved in benzole. I am having some plate-boxes made of gutta percha thus—instead of the lid shutting in the ordinary way, it would close over another outer part; the bottom part of the box to be made as usual, and round the top an additional part to be added, projecting out a little, and of sufficient height to allow the water to cover the plates in the box, whether one or a dozen, the additional space at the side allowing for the plates to be taken out of the box in the same way that an ordinary box would allow when opened; the lid being made to close over this in the usual manner, and water-tight.

By a dry process positives on glass may be printed very quickly, and the film is less liable to be injured in handling. The dry processes also appear to produce the sharpest pictures, especially with a gallic acid development.—I am, Sir, yours obediently,

ROB. ELLIOTT.

Pensher Iron Works, Fence Houses,
21st Feb., 1857.

ANSWERS TO CORRESPONDENTS.

Glasguensis.—1. We do not think that there is any better way of preparing albuminized paper than the method you mention of plain chloride of sodium and albumen. There is no real advantage attendant on the use of sugar of milk, sugar-candy, or serum, in addition. 2. We prefer Spiller's positive developing solution. The irregularity you complain of is not due to the developing solution, but is owing, most likely, to the bath not being sufficiently strong.

D. Williams, Holloway.—1. We have never used the paper you speak of, but friends who have, give it the same character that you do. Even should a special treatment be recommended, your results are so good that it would be very injudicious to change the process materially. 2. The specks on the picture would have no influence on the permanence of the print, if they are so small as to be almost invisible: good washing is the safest preventative against fading. 3. The machine is so contrived that the liquid is squeezed out of the sponge each time, and then clean water from the tap above flows into it: we do not see the possibility of the hypo remaining long in the sponge.

E. Rogers.—The rapidity with which pictures are taken depends quite as much on the lens as on the collodion. Combinations of lenses are made with a very large aperture and short focal length expressly for the purposes you mention. Try the collodion process given in the paper on the photography of the moon in the present number.

Alpha.—The method you have adopted in rendering the albuminized paper sensitive is very good, with one exception.—Keeping the print, after removing from the hypo, in running water for four hours, is not nearly sufficient washing, and subsequently passing a hot iron over it, while the hyposulphite of silver was still in the paper, would be certain to cause a precipitation of sulphide of silver in the pores. That this has happened in the picture sent is evident by the slight granular opaque appearance when looked through. Try, *at least*, twenty-four hours' soaking in water, changing every few hours, and towards the end having the water nearly boiling. We also think the albuminized paper is not very good. How was it prepared? as some of the numerous bad points about the print you forwarded may be caused by that.

Collodion.—We cannot refer you to a better answer to most of your queries than the one to Bromide, which you quote, (p. 43). Although we stated there that iodide of cadmium in collodion would not cause it to become red, yet, of course, if any other unstable body be associated with it, as, in your case, iodide of ammonium, it will not retard that from decomposing. Try the formula given in this number.

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 6.—MARCH 15, 1857.

N a former number we announced the discovery y Mr. Newton, our Viee-Consul at Cos, of a buried reek eity, and stated that we might soon ex-ectto see photographie views of the interesting elics. M. Place, French Consul at Mosul, has ecently sent home an account of a discovery astonishing, that the photographic vouehers hich aceompany his statemcnts are alnost ecessary to convince us of the truth of what ould otherwise be incredible. This is nothing ss than the diseovery of the ruins of the Tower f Babel. The remaining two stories of this ructure present a majestic sight, visible more ian twenty leagues off. The base is more than 20 yards square. The bricks are formed of ire elay, cemented together with bitumen—a ream of which is flowing in the neighbour-ood; they are entirely covered over with scriptions. This is a striking confirmation of e aceount given by Moses, as the stream of tumen yet in existence is a sufficient answer those who doubted whence the builders ob-ined such a cement; and the elay bricks, thoroughly burnt," which they used in plaee of one, are yet remaining. We doubt not that hen the inscriptions upon them are deeiphered, ey will be found to confirm still further the count given in the saered volume.

Father Secehi has recently put the theory of ambert, as to the greater or less luminosity of e centre of the moon, compared with its edges, the test of experiment. Photographie pictures ere taken in from five to thirteen seconds, and no case, either at the moment of the image coming visible or on the developed positives negatives, was there the least difference in tensity. So far, Lambert's theory and Seeehi's periment are diserepant.

M. Jamin, professor of physies at the École olyteehnique, has been submitting the produe-ons of our old masters, as well as the more odern sehool of painters, to a most severe test, d finds them, one and all, fail in giving a true ea of the intensities of light and shade. By eans of an ingenious and novel photometer, is enabled to eompare the proportions of ght given off by two contiguous bodies. Many periments with this instrument led to the sult that an object in sunshine is about *twenty* mes more illuminated than the same in shadow, dependent of the colour or composition of the rface. On looking through it at a landscape painting, in which objects are represented in full sunshine and in shadow, the former is seldom more than *four* times as bright as the latter. In a night scene, where the artist has given representations of a lamp, and white objects illuminated by its means, the source of light is from *twenty* to *thirty* times more luminous; whilst in nature the light is 1500 times more intense than the illuminated object! In views of interiors, the sky is represented as about *six* times brighter than the eontiguous parts of the window, while experiment shows that it ought to be upwards of 400 times! Wishing to see whether these discrepancies arose from errors of judgment or incapability of the materials em-ployed, to give more correct results, M. Jamin took the two greatest contrasts whieh can be found in a colour box—brilliant white and in-tense blaek: the differences of luminous intensity were not more than as eighty to one, showing that a true representation of nature is unap-proachable with the present appliances of the painter's art, exeept perhaps in very rare eases.

Armed with this instrument, how different our ideas must be respeeting photographie truth as it is called! Take the finest produetions of our English or foreign artists; ean they pass the ordeal whieh has so sweepingly condemned all that we are taught to regard as nearly un-approaehable to modern genius? The voice of publie opinion is nearly unanimous in its appro-bation or eensure, as far as photography is con-cerned; Bedford's views, Williams's exquisite stereoscopic subjects, Legray's cloud and sea pieces, are exalted almost beyond the reach of eriticism, much less of censure. Surely if any-thing ought to be true to nature, a picture should merit that title towards the produetion of whieh human agency has done nothing but pre-pare the tools and place them in nature's reaeh. How do they bear the test? In the two former examples, do we find contrasts as great as 1000 to 1 between the intensities of the sky and ground, as M. Jamin says we should? On the contrary, we praise them beeause the difference is actually less than could easily have been ob-tained were the brighter parts, which do not rise mueh above a half tint, pure white? And do we not rather call a photograph "soot and white-wash," where nature, striving to be true, gives us on our sensitive surfaces sueh faint approaehes to her glorious contrasts of light and shade which the materials we allow her to work with will admit of? Taking another instance, what will our new test tell us of Legray's clouds. Measured by the pho-tometer, a eloud, according to the illumination, is from a thousand to a million times more lumi-nous than a terrestrial body. In this picture

we doubt if in any part of it a greater contrast could be found than in the proportion of 1 to 30, and yet, strangely, its great apparent fault is too great contrast, giving the idea of a moonlight scene rather than one in the full blaze of daylight.

It is a difficult matter to condemn as utterly untrue pictures to which universal praise is given for truthfulness; but still the laws of nature, as interpreted by science, are unerring. How shall we reconcile the contradictory statements of photography and photometry?

In page 81 of *Photographic Notes* there in an allusion to an union between the Liverpool and Manchester Photographic Societies. This is incorrect; there being no nearer tie than that friendly bond of brotherhood which unites all scientific societies together.

MANCHESTER PHOTOGRAPHIC SOCIETY.

On the 4th instant this society held its usual monthly meeting, at the rooms of the Literary and Philosophical Society, George-street.

At the meeting of the council, J. Sidebotham, Esq., presided; and after the usual formalities a proof copy of Photographic Illustrations was approved, (this is expected to be in the hands of the members before the next meeting.)

A resolution was adopted that notice be required from intending exhibitors at the evening meetings, that the Council might know exactly what business was before them.

Some further correspondence with Mr. Delamotte as to the Art Treasures Exhibition was produced, and the secretary was ordered to write to the Royal Society to request a copy of Secchi's photograph of the lunar crater Copernicus.

It was resolved to close the list of subscriptions to the Archer testimonial that evening, and transmit the amount to Mr. Archer.

It was proposed to hold a conversazione of the members and friends of the society in the summer, during the interval after the close of the session, but the subject was deferred for further consideration.

It was also resolved to request a paper on photographic printing from Dr. Frankland.

The secretary reported that a quarterly meeting of the Literary and Philosophical Society had approved of the permission granted to this society to meet in their rooms; and that the Liverpool Photographic Society had passed a resolution reciprocating the one adopted by this society at the last meeting, admitting members of other photographic societies to the meetings of this.

At the meeting of members Arthur Neild, Esq., presided; and Mr. Sidebotham read the following very interesting paper "*On the Collodio-Albumen Process*," as used so successfully by him:—

At the request of some of the members of this society, I have prepared the following paper on the collodio-albumen process; I have little novelty to offer, having been largely indebted to the labours of others, but simply lay before you the formulæ, and mode of manipulation, in which I have been most successful, and which, in the hands of any one with ordinary care, is capable of producing the most beautiful results.

I need scarcely remark on the great value of a glass process, by which the plates can be prepared before an excursion, the views taken in the camera at any time during the space of several weeks, and the pictures developed on the return home, thus dispensing with all chemicals, tents, and bottles, and requiring only the camera and stand, and a plate box, with some convenient mode of changing the plates.

The albumen process possesses these advantages, but requires such a long exposure in the camera that, for landscapes where figures are introduced, it is quite useless; and the modes of preserving the collodion plates with deliquescent salts, and with honey, oxymel, or glycerine have all one great disadvantage, the liability to collect dust in changing from the plate box to the dark frame.

The gelatine and dextrine processes are well spoken of by their adherents, but in my hands they have not been so rapid in action or certain in results as the collodio-albumen.

The discovery of this process is usually attributed to the late Dr. Taupenot. I do not know exactly when he first published the results of his experiments, but would refer you to page 47 of the *Photographic Journal* for 1854, to a letter from the Rev. William Law, dated Sept. 29th in that year, where the principle of the collodio-albumen process is clearly laid down, and ask whether, if he be not the originator of this process, he might not with justice claim its independent discovery?

In this process we have eight distinct operations to obtain the negative.

1. Cleaning the plate.
2. Coating with collodion.
3. Sensitizing the collodion film — washing the plate.
4. Coating with albumen.
5. Sensitizing the albumen film and washing it.
6. Exposure in the camera.
7. Developing the picture.
8. Fixing.

This appears a formidable list, but it is more in appearance than reality. I will take the operations in the order above.

1.—Cleaning the Plate.

This is best done with a little nitric acid, well rubbed over, and then washed with plenty of clean water, dried with one soft linen cloth and polished with another; many plates when new require nothing but water, but it is best always to use the acid, to be quite safe. I have never found the necessity for the elaborate cleaning some persons advocate. The glasses should be cleaned and stored in a dry plate box, and just before they are used should be polished with a dry, warm, linen cloth.

2.—Coating with Collodion.

This is done in the ordinary manner.

3.—Sensitizing the Collodion Film—Washing it.

The plate, after coating, is plunged into a bath of aceto-nitrate of silver, in proportion—

Water	1 ounce.
Nitrate of silver	40 grains.
Glacial acetic acid	30 minims.

; this bath is rather strong, it should be satu- ted with iodide of silver, or the plate may ›t be evenly eoated. When ready take it from ıe dipper and pluuge it into a bath of distilled ater, move it up and down a short time to ash off the silver, and then transfer it to a ›cond bath, and perform the same operation; ıen take it out and rear it up to drain, with its ›rner on blotting paper; in about a minute it ill be ready for the next operation.

The above no doubt appears a tedious pro- ss, and for a single plate it would be so, but preparing a number of plates it is not the se; thus, when plate No. 1 is taken out of the ver bath and put in water, whilst it remains ere No. 2 is eoated and put in the silver bath, this time No. 1 is ready to be moved about a tle and changed into the seeond bath; No. 2 now ready to change from the silver bath to e water; this done, No. 3 is eoated. No. 1 is w ready to take out and drain, then No 2 to ange into the seeond water bath and wash; ›. 1 is now ready to eoat with albumen, and on; once begin the series in proper order, the ıtes may be prepared with great ease and ›idity, and no time be lost in waiting.

We now come to the next operation.

4.—Coating the Plate with Albumen.

Having tried most of the published formulæ the preparation of the albumen, and many periments with different proportions of iodides l bromides, I have fixed upon the following as swering the best. It is taken, with slight eration, from the *Photographic Journal* for gust, 1856, from the letter of a correspondent o signs E. F. To his paper, and to that of . Ackland, in the same journal, I would refer; y have been of the greatest use to me, and l be to any one pursuing this proeess.

Albumen...........................	1 ounce.
Distilled water	$\frac{1}{4}$ "
Liquor ammoniæ	10 minims.
odide of potassium	5 grains.
Bromide of potassium	1 "
Solution of iodine, 5 gr. iodine to 1 oz. water..................	2 minims.

ssolve the iodide and bromide in the water, then l the ammonia and iodine, put this into a basin h the albumen; and beat it well up to a froth h a silver fork; let it stand a little and then er through fine calieo, and put it into a bottle h a small piece of camphor: a large quantity y be made at onee as it keeps very well; some I de early in September is as good as ever: some es the albumen beeomes muddy, and throws vn a white preeipitate, it is however no worse, oured off carefully and filtered. We will now ›pose the eollodion plate to have drained a ıute, some of the prepared albumen is poured n a beaker glass on the eentre of the plate, twice round the edges, and poured off again › another beaker, through a funnel containing ›iece of fine calieo; this calico should be efully bleached, and each side well singed eral times to take off all the lint.

The plate must now be reared up on a shelf, h its face to the wall, and its corner resting on a piece of blotting paper; it will thus dry fectly even, without any artificial heat, in the rse of few hours.

After the albumen is put upon the plate it may be exposed to the light without fear: I have exposed some plates to the full light of the sun, and kept others, prepared at the same time, en- tirely in the dark, without being able to perceive any difference in the finished negatives.

For the sake of convenienee I usually prepare a number of plates at a time, and keep them in this state ready for the fifth operation, viz., sen- sitizing the albumen film. I eannot from my own experienee speak of the length of time the plates will remain good; I have kept some a little more than two months without the least pereeptible change, and I do not see why they should not keep much longer if kept perfeetly dry.

5.—Sensitizing the Albumen Film and Washing it.

Dip the plate for about half a minute in the same aceto-nitrate bath which has been used for the eollodion, then ehange it into the water bath, and afterwards *well* wash it under a tap: let the water come in as strong a stream as the film will bear, all over the plate, then give an extra wash to the edges; you cannot wash it too mueh if you do not injure the film, and most beginners fail in this part of the proeess more than any other. The plate must now be dried as before, by rearing up on a shelf upon blotting paper; if required soon it may be dried at a stove or fire, but I prefer if possible to allow it to dry spontaneously. When thoroughly dry put the plates in boxes ready for use, earefully exeluded from light. As to the keeping qualities of plates thus prepared, I will only speak of my own experienee. I have just used some plates made sensitive six weeks ago, they were quite as good and as sensitive as freshly prepared ones, and would probably have kept mueh longer.

6.—The Exposure in the Camera.

The only data I ean give with certainty are from the use of a stereoseopic camera, lenses 5 inehes foeal length, and an aperture of 3-16ths of an ineh. In the winter, with snow scenes and bright weather, I gave two to three minutes exposure in the morning; with no snow, but bright sun, three to five minutes; and in Paris, early in February, with a bright sun, I gave from one to two-and-a-half minutes, aeeording to the subject. Negatives and prints from many of these are on the table, showing that the expo- sure has been suffieient.

I may mention that, as a eomparison with the albumen process, I one day, in Paris, met with a French photographer taking stereoscopie pie- tures; his lens was about $4\frac{1}{2}$ inehes foeus, and nearly half an inch aperture, and he was giving seven minutes exposure, whieh was more than ten times longer than mine, considering the larger aperture he was using.

The longest time I have kept a plate between exposure in the camera and development is eighteen days. A series of carefully conducted experiments as to the longest time a latent image could be thus preserved, would be ex- tremely valuable and interesting.

7.—The Development.

This operation is one which requires great care and attention. I can now see that I have lost many good negatives from not knowing how to humour them during this process.

Prepare the following solutions :—

Distilled water	20 oz.
Gallic acid	1 dram.
Pyro-gallic acid	10 grains.
Glacial acetic acid	½ dram.
Alcohol	½ dram.

Dissolve and filter.

Silver Solution.

Distilled Water	20 oz.
Nitrate of Silver	30 grains.

To develope, pour into a clean glass dish sufficient of the gallic acid solution to fill it to the depth of nearly half an inch, then put the plate into it, face upwards, and agitate the dish a little, so as to bring fresh solution in contact with the surface; in about five minutes add half an ounce of the silver solution, and again agitate the dish to mix it well; the picture will now very soon begin to appear, if it does not do so in three or four minutes add a little more of the solution: it is here that great care is required; if the plates have been exposed sufficiently *very little* silver is required, too much would cause the image to develope so rapidly all over, that before the sky and intense blacks were deep enough, the half tones would be overdone. A little practice will regulate this, but no amount of description can; the safe plan is to begin with a very small amount of silver, and add more if required. Develope until the negative is strong, as it loses a little in the fixing.

8.—Fixing.

This operation is very simple, put the plate into a dish of hyposulphite of soda, about 1 oz. to a pint of water, leave it until the blue film disappears, and then wash well in clean water, and rear up to dry.

The above is the whole process; but I have still a few remarks to make,—and first with reference to the collodion. Almost any description of collodion will give a picture, but to produce fine negatives the following qualities are requisite; freedom from structure—that it should contain very little water, and rather a smaller proportion of alcohol than is usual—and that it contain free iodine, 10 or 12 drops of tincture of iodine to the ounce is not too much. Mr. Ackland recommends 1 drop of glycerine to the ounce, and in some specimens of collodion I have found this a great improvement.

In preparing plates for printing upon, to make the transparent stereoscopic slides, there is no occasion to render the collodion film sensitive, but instead of the nitrate bath, dip the collodionized plates into a bath of water, and proceed as before. They require from ten to twenty seconds exposure in the printing frame with ordinary day light, or about half an hour with the light from a moderator lamp.

For the purpose of printing upon, old collodion which has become useless for other purposes answers very well, and generally gives a beautiful opalescent appearance, which does not alter in the hypo bath, and answers the purpose of a ground glass; as specimens on the table will illustrate.

The two great sources of annoyance in this process are—blistered plates, and marbling and spotting in the development: the latter is due entirely either to dirty dishes, or dirty solutions, and the remedy is obvious; the other may proceed from several causes—one is from the plate being damp before the collodion is poured on; another is from having a collodion too thick, or too contractile, causing a different expansion of the albumen and collodion when put in the nitrate bath; another is from having too much acetic acid in the bath, or in the developing solution. With a little care all these may be avoided; and even when the plate has been covered with blisters, with care in the development not to allow the solution to become dirty, the blisters will all disappear when the plate is dry, and leave no marks perceptible by transmitted light.

This process, even in its present state, is highly satisfactory, but, I am convinced that ere long we shall have it much simplified. Experiments are being made in the right direction which will, I think, result in the reduction of the time and trouble of the preparation of the plates, by at least one half, besides having other advantages.

I cannot conclude without returning thanks to my friend Mr. Neild, and one or two others of our members, who have worked with me in this process, and rendered assistance when any difficulty presented itself.

Mr. Sidebotham exhibited some very beautiful pictures, taken by him in Paris a few weeks ago and illustrated his paper by preparing a plate and developing a picture on a plate which had been prepared six weeks, and exposed last Saturday.

A conversation followed as to the propriety of leaving any traces of free nitrate of silver in the plates; the practice being to remove the same as far as possible.

A camera for pictures 10 by 8 inches was exhibited, made by Mr. Dancer, and having the same arrangements for dry collodion plates as in his patent stereoscopic camera; except that the camera is not attached to the dark box, the plates being removed from the one to the other by a dark slide.

Mr. Pyne also exhibited a stereoscopic camera of a very portable and convenient form, with an exceedingly light tripod stand.

Mr. A. Brothers brought some very beautiful photographs, which had been lent him, of the Falls of Niagara, and a very curious Indian photograph, collodion on canvas, apparently a transfer.

The usual complimentary vote to the chairman having been passed, the members separated after an exceedingly pleasant meeting.

LONDON PHOTOGRAPHIC SOCIETY.

The monthly meeting of this society was held [on] Thursday, the 5th instant; J. Percy, M.D., F.R.S., Vice-president, in the chair.

The minutes of the former meeting were read and confirmed. Several new members were ballotted for and duly elected.

Mr. Hardwich then read a paper on the "*Manufacture of Collodion*," of which the following is an abstract:—

The Author commenced by stating that although the papers by Mr. Hadow, published in the Society's Journal, in which exact formulæ are given for the manufacture of collodion and the best proportion for its solvents and th

odizing materials, might seem to leave othing to be desired; yet, as a uniform ollodion is a thing which makers often fail to roduce, there are still some points which reuire further elucidation, and the experiments ere alluded to were undertaken with this object. he advantages or disadvantages of employing ethylated spirits, chloroform and iodoform, lso the various iodizing materials, formed the ubject of the author's remarks.

"Methylated Ether" may be procured at bout half the price of pure ether, and corresonds with the latter in several properties. In hese experiments it was redistilled carefully om caustic potassa, thus reducing the sp. gr. o ·718 at 60°. Fahr. The methylated spirit was urified in a similar way by rectification from ry carbonate of potassa, and had a sp. gr. of 820 to ·825.

The Collodion was prepared with

Methylated ether ....5 drachms.
Methylated alcohol ....3 „
Iodide of ammonium ....4 or 5 grains.

Collodion prepared from this formula was ound fully equal in sensitiveness, intensity, and alf-tone to a similar sample prepared with pure lcohol and ether, intense negatives being taken the shade in 4 seconds, with a double combination lens of 2¼ inches aperture and 6 inches ocal length, whilst with a small stereoscopic iew lens not more than 8 seconds were required nder similar circumstances.

The sensibility and general properties of the ethylated collodion being found so good, the port would have been favourable had the exeriments been here discontinued; but on connuing the trials with commercial methylated pirits and ether, without having submitted em to the previous purification, the author rived at an opposite conclusion, for the followg reasons:—

1st. Methylated ether is less uniform in comosition than ordinary ether, and shows a great ndency to become acid and liberate iodine om alkaline iodides. No two samples giving milar results, unless they had been previously ectified from caustic potassa, which is an operaon to be avoided if possible.

2nd. "Methylated Spirits" possesses the proerty of absorbing a certain amount of free dine: thus collodion, prepared as stated above, ften becomes deep coloured when first mixed, nd in the course of a few hours becomes colurless, or, at most, of a straw yellow tint.

The addition of a bromide facilitates the aborption of the iodine.

3rd. Iodized methylated collodion does not ppear to retain its sensitiveness for so long a me as the ordinary collodion. For experiments ade to determine this point, iodide of ammoium was employed at the outset. The two ollodions were nearly equal in sensitivess; but t the expiration of a fortnight the pure collodion was found to work the quickest, although, t the same time, it was most highly coloured. he absorption of iodine by methylated spirits oes not therefore preserve the sensitiveness t a constant point.

4th. On taking the average of a large number f experiments it was found that the employent of methylated spirits occasioned great uncertainty in the physical properties of the film, the image being sometimes more and sometimes less dense than was correct.

Therefore, for certainty and constancy of action, the employment of pure ether and alcohol are recommended in preference to methylated spirits or ether, although for a few days after the methylated collodion is made the results obtained therewith may leave nothing to be desired; especially if iodide of ammonium be employed as an iodizer.

Chloroform, added to collodion, was found to remove certain markings on the film when an unusually limpid collodion was used; but the glutinosity, due to the employment of pyroxyline prepared at a low temperature, was not remedied, nor did it act in any way as an accelerator—any action of this kind which it was found to possess being doubtless of a physical nature, and not to be depended on for uniformity.

Iodoform injures the sensitiveness and halftone, when added in quantity. As both alcohol and iodide of potassium frequently contain carbonate of potassa; and a mixture of alcohol, iodine and carbonate of potassa produce iodoform, these bodies should be tested previous to using, by reddened litmus paper, the blue colour of which would be restored by a trace of carbonated alkali.

Iodide of Tetrethylammonium.—This salt was recommended by Von Babo as producing a collodion giving uniform results. The author has experimented with a nicely crystalized specimen, with which Professor Hoffman kindly supplied him. It was used in the proportion of 4 grains to the ounce of collodion; it does not easily dissolve unless a considerable quantity of water be present; iodine is liberated from it in the usual way if the ether be acid or oxidized. The sensitiveness of the collodion so prepared, corresponded at first with an iodide of potassium collodion, but it remained stationary for a longer time, and the same progressive liberation of free iodine did not take place. This was explained by the fact of the iodide of tetrethylammonium being the more stable iodide of the two. As, however, we are now acquainted with the unusual stability of iodide of *cadmium*, the author does not think that any advantage would be gained by substituting for the latter a far more expensive preparation, and one, at the same time, less soluble.

Iodide of Iron was briefly alluded to as being one of the worst iodizers that could be employed.

Iodide of Ammonium is one of the best iodizers when pure; but it is very liable to be contaminated with sulphate and carbonate of ammonia, which latter is very prejudicial to the good keeping properties of the bath, by rendering it alkaline.

Iodide of Potassium is very liable to be contaminated with iodate and carbonate of potassa, both of which lessen the sensitiveness of the film. Its employment is also very liable to cause spots on the film from the sparing solubility of this salt in the ethereal mixture. If the iodide of potassium has a smell of garlic, as is sometimes the case with commercial samples, it should not be employed, as the peculiar body which gives rise to this smell has very retarding effects on the sensitiveness of the film.

Bromides and Chlorides, added to collodion, seem to diminish the sensitiveness of the excited film. Under certain conditions, however, they have a marked effect in increasing the intensity of the developed image. This was rendered very evident when certain kinds of organic matter, nitroglucose for instance, were present. If a little of this substance be dissolved in alcohol containing ammonia, it will in all cases produce intensity; but when a bromide or chloride is present the effect will be unusually strongly marked, and particularly so in the high lights, which will be impenetrably black and opaque. These facts are considered by the author to partly explain the differences of opinion which have always prevailed respecting the exact nature of the action of bromides in the paper processes. The development of the image may easily be confounded with its impression in the camera; and an agent having the effect of making that image more vigorous, would readily be thought to increase the sensitiveness to light.

Mr. Fenton stated that he had worked with collodion prepared with ordinary methylated ether and iodide and bromide of ammonium, with an acid bath. The result was not satisfactory, having very little intensity. When the methylated ether was distilled with potassa the result was beautiful, possessing great brilliancy and good half tone. A whole year's experience showed that a methylated collodion was rather slower than the ordinary collodion, but very certain in its action, and did not vary in any appreciable degree for a considerable time. The light during last autumn was stated to have been exceedingly bad for photographic work.

Mr. Malone considered lime to be a much better substance for depriving alcohol of water than potassa, as recommended by Mr. Hardwich. Methylated spirit was objectionable on account of the uncertain nature of the constituents of the wood spirit employed in its manufacture. Some experiments which the speaker made with Mr. Fox Talbot, about ten years ago, were described as tending to prove that the addition of a bromide to calotype paper would, under some circumstances, tend to increase the sensitiveness, but not in sufficient degree to make it a matter of much importance. With respect to the employment of bromine in the production of colour, Mr. Maskelyne suggested its employment some years ago, and produced some copies of trees by this means; but these did not appear to be superior to those obtained by the use of iodine in the ordinary manner.

Mr. Crookes stated that there were some constant results attendant upon the employment of iodides, bromides, or chlorides in the paper processes, which he had met with in the course of experiment. On employing a sensitive surface of pure iodide of silver there was very little likelihood of those parts of the picture, upon which the light had acted most strongly, becoming red and transparent, even after a very prolonged exposure; but the addition of a bromide or chloride was sufficient to give it that objectionable tendency.

Mr. Malone enquired if Mr. Crookes considered the addition of a bromide to the iodide was of any advantage in copying colour.

Mr. Crookes thought that it was of very little use. There is reflected from vegetation such a mass of light, which equally affects bromide and iodide of silver, that the action of the narrow band of rays in the solar spectrum, to which bromide is more sensitive than iodine, is almost unnoticed; and considering that bromides are only used in conjunction with a large excess of iodides, even this slight advantage disappears, and the supposed value of bromide for copying colours is seen to be one which it does not deserve.

Mr. Shadbolt considered that employing bromide in the paper processes had a tendency to make the sky rotten. With respect to the blue contained in green light being active in giving an impression, he quoted an experiment to show that the yellow accompanying the blue would neutralize its action, as the yellow ray was not merely inert but absolutely destructive. In reference to some remarks of the last speaker, he said that yellow flowers, although of the same tint, would have very different photographic properties. The experience of Mr. Glaisher, in the meteorological department of the Greenwich Observatory, was alluded to as proving that, when gaslight was used, they found a mixture of iodine and bromine was more sensitive than iodine alone. With respect to methylated collodion, Mr. Wenham was stated to have prepared a similar material, in which methylic ether was employed. The appearance of different dried films under the microscope was lastly alluded to.

Mr. Malone considered that in experiments on this point it must be remembered that the solar spectrum was the only pure source of colour, and that coloured glasses were very liable to cause erroneous conclusions, inasmuch as the transmitted rays often bore no relation to their apparent colour.

Mr. Hardwich said, in reply to some observations of Mr. Crookes, that in experimenting with bromides in collodion, it must be remembered that the presence of a very small amount of organic matter entirely reversed some of the effects of this body, thus, if added to a pure iodized collodion it had the effect of injuring the intensity of the more highly illuminated parts, but if a small portion of sugar was added the intensity was remarkably increased.

Mr. Anthony much preferred a bromized collodion, as giving pictures far more beautiful in half tone, and with truer rendering of the effects of colour, than iodized collodion.

The Chairman called upon Mr. Crookes to give results of his experiments respecting the superior sensitiveness of bromine to artificial light.

Mr. Crookes agreed with Mr. Glaisher as regards the advantage of using bromide for artificial light. Although in daylight the narrow band of coloured rays, in which bromine was superior to iodine, was nearly overpowered by the immense volume of more strongly acting higher rays; yet in artificial light the contrary effect took place, this narrow band was the most voluminous of the active rays, and consequently the advantage of adding bromides to the iodizing bath was very apparent. A mixture in the proportion of their atomic weight was found to give the best results. The speaker denied that any obliterating action of the yellow rays would

ɜ apparent in ordinary camera work. An imression given by the blue rays in a few minutes ould require exposure of some months to the ellow rays to obliterate it.

Mr. MALONE thought that the obliterating ɔtion of the yellow rays was confirmed by some f Mr. Claudet's earlier experiments on the aguerreotype plates.

Sir W. J. NEWTON said that he added bromides to ıe iodizing bath for the paper in his printing proɜss, and found the half tints better brought out.

Mr. SHADBOLT then read a paper on "*Positive rinting with a New Toning Agent*," of which the llowing is an abstract:—

A number of sheets of paper are prepared with 10 grain solution of chloride of ammonium, or a) grain solution of chloride of barium, and en rendered sensitive by means of nitrate of lver, the strength of which depends upon cirımstances which are detailed below. The printg is to proceed till the picture is much darker an is ultimately required; the greater part the free nitrate of silver must then be removed ɔm the surface by washing slightly in water; is then placed in a dish having its upper edge ound, and on it poured a strong solution of amɔnia diluted with about five or six times its bulk water. A sheet of glass is then placed on the ɜh, so as to enable the operator to watch the ogress without annoyance from fumes.

In a few minutes the whole of the unanged chloride of silver is removed from e picture, which now presents a very ugly ange yellow colour. It is then to be passed veral times through running water, and afterırds soaked for five minutes in clean water o or three times, by which time the whole of e ammoniacal solution of chloride of silver ght to be removed. The print, still wet, is now be transferred to a similar dish with a glass ver, and a solution of sulphide of ammonium pidly poured over the face of it. The rapiy of the colouring is almost magical—before ɜ flood has gone over the surface the part first ıched is blackened, and as soon as the picture covered with the liquid it may be removed, d, after washing once or twice in water, hung to dry, and then at once mounted if necessary.

Any sort of paper will answer, with the single ception of the albuminized, which as yet has t given the author satisfactory results.

With respect to the strength of the nitrate of ver bath, to obtain a good print it ought to ry with the kind of negative employed; a ak negative will give the best results if the sitive exciting solution be as strong as 100, 0, or, in extreme cases, 300 grains to the nce; it should be applied with a glass rod.

The author then stated that he could not ɜak from long experience regarding the keep; qualifications of these pictures, but it was ɔbable, from the rationale of the process, that ɜy would be found to be quite as permanent any pictures toned without gold, and desired hear the chairman's opinion on this point.

DR. PERCY then resigned the chair to SIR W. Newton, and stated that seven or eight years' perience from specific experiments had satis1 him as to the permanency of sulphide of ver. The agent used by Mr. Shadbolt was st introduced eight or nine years ago by Dr. Shaw of Birmingham, who stated that no fading whatever had taken place during that time on paper so prepared. In 99 out of 100 instances where persons complain of sulphur-toned pictures fading, it is entirely their own fault, owing to insufficient care being taken in the washing. Great diversity of opinion exists with respect to the orthodox colour for positives; pictures by the speaker, much admired in some quarters, having been designated by a gentleman present as of a "nasty" colour. They were on albuminized paper, and were toned with sulphuretted hydrogen; a few seconds' exposure to which removed the disagreeable red tint.

Some further discussion here ensued on the composition of the image after toning with sulphur, in which Dr. Becker, Dr. Percy, Mr. Hardwich, and Mr. Malone took part, but nothing of importance was elucidated; and after votes of thanks to Mr. Hardwich and Mr. Shadbolt for their papers, the meeting adjourned.

NEW PRESERVATIVE PROCESS.*

By F. MAXWELL LYTE, Esq.

IT is a well-known property of gelatine, that when it is dissolved in hot water, allowed to gelatinize, melted, and again cooled, and this process repeated many times in succession, the jelly, at first stiff, gradually loses its tenacity, until at length it no longer sets, but remains liquid even when cool. The cause of this is a gradual change, which comes over the gelatine itself, by which it would ultimately become converted into a new substance, white and crystalline, called by chemists glycocine or glycocoll: but the fact is, that before the formation of this substance, the gelatine undergoes previous changes, and it will be found to have lost nearly all gelatinizing properties before an appreciable amount of glycocoll has been formed. The change which takes place is not yet thoroughly understood, and well merits further research; it is, perhaps, similar to that which takes place in pectin, the gelatinizing principle contained in fruits, which by boiling becomes converted into parapectin, and by boiling with acids into metapectin. The only difference is, that in the case of gelatine, acids seem only to accelerate without changing the nature of the alteration produced by simple ebullition; whereas from pectin two substances, having different chemical properties, are produced.

I propose, then (for want of a better name), to call the gelatine, in its altered condition, metagelatin, on account of the similarity of the change to that produced by the treatment above mentioned of pectin. It has all the properties requisite to form a perfect varnish for the preservation of the collodion plate in the dry state, and in this respect seems far to excel albumen, gelatine, honey, or any other agent which has yet been proposed. It possesses sufficient fluidity, is unacted on by nitrate of silver in the dark, is soluble in water, dries into a transparent film, without cracking, does not retard the sensibility, and, when softened with a little honey, supports the action of the developer without the least tendency to blistering. The

* *London Photographic Journal*, Feb. 21, 1857.

change, however, by simple boiling, which is at best imperfect, may be rendered far more sure and rapid by the presence of a strong mineral acid, as the sulphuric for instance. The following is an outline of the method I employ:—

Take 1½ oz. of pure white gelatine and dissolve it in 10 ozs. by measure of boiling water, in a porcelain capsule. When thoroughly dissolved, add to it 60 minims of strong sulphuric acid, which has been previously diluted with 2½ ozs. by measure of distilled water; boil for five minutes, then remove the capsule from the fire, and allow the liquid to cool completely. Then heat it up again to boiling for five minutes, and again let it cool; this time it will most probably not gelatinize, but should it do so, another warming-up and subsequent cooling will be sure to bring it to the necessary condition. When the liquid no longer sets on cooling, the acid must be neutralized by the addition of powdered chalk or whiting, till effervescence no longer takes place; and the sulphate of lime thus formed is to be removed from the liquid by squeezing it through a piece of fine linen. In order to prevent all danger of blistering during development, which might ensue from using this solution of metagelatin alone, I find it more convenient, according to the method of M. Taupenot, to combine it with an organic deliquescent substance, such as, for instance, honey or glucose, or indeed any of the other substances which have been proposed for preserving plates in the moist state since the introduction of honey. Honey, however, seems to answer so perfectly, that I am inclined to adopt and recommend it in preference to any other.

The following are the proportions in which I combine the syrup:—

Solution of metagelatin, 5 ozs. by measure.
Fine honey..................2 drs. by weight.
Distilled water ....5 ozs. by measure.

When the plate is withdrawn from the nitrate-bath, it is to be held for a moment with the corner resting on a piece of blotting-paper; it is then to be held horizontally and a portion of the syrup to be poured on at one of the upper angles, and flooded carefully from there to the opposite angle, in a similar manner to that by which the plate has been previously coated with the collodion. This portion of syrup is to be thrown away as it runs off the plate, and it will have carried off and driven before it a considerable portion of the nitrate of silver, still leaving behind a sufficient excess to retain the sensibility. Another portion of syrup is now to be poured on, and this poured off and on several successive times till it takes evenly over the whole surface. The plate is now to be stored away in the dark box to dry, and it will perfectly retain all its sensibility for many days, or even, in cool weather, for weeks.

To develope, all that is necessary is, to dip the plate into cold distilled water, or cover it for a minute with water, so as to wet the surface completely and evenly. The picture is now to be developed as usual, with the ordinary pyrogallic acid solution, and fixed with a solution of cyanide of potassium. If the negative, when finished, is not found to possess the requisite vigour, a circumstance which is liable to occur in cold weather, it may be strengthened by pouring over it a solution of gallic acid to whicl has been added a little of the nitrate-bath.

In publishing this process, I desire it to b understood that I by no means wish to clain being the first to apply gelatine for the pre servation of the collodion plate in the dry state but rather the application of the gelatine in it changed state.

Since writing this process for publication, have just produced a perfect and spotless nega tive on a plate which had been kept six weeks

I can hardly yet fix a time for the exposur of these dry plates, but from my present expe rience I should be inclined to say about one half longer than with the ordinary moist pro cess. The unusually cold weather we have a present may, however, have some effect i retarding the action.

With regard to the correspondence betwee J. S. and myself on the subject of the honey process, I think the readers of the *London Photo graphic Journal* would hardly thank me were I t burden its columns with letters as long-winde and irrational as J. S.'s last.* I feel it sufficient t say in reply, that any reader of it will find that h inadvertently, at its very commencement, ad mits the very point for which I contend, viz that I was the first to apply honey to the col lodion plate, obtaining thereby a retention o sensibility for "a few hours," an effect neve before attained except by the nitrate of mag nesia process of Messrs. Crookes and Spiller And if by the same means I was enabled t retain an exalted sensibility, is this any proo against my point? True that Mr. Shadbol has, by removing a portion of the nitrate o silver, prolonged the period over which th plate may be preserved without spoiling; bu as in reality the preservation for a few hours i of at least as much importance as preservatio for days, and considering the defects arisin from dust and other causes in long-preserve plates, it seems to me preferable to abando the idea of a moist process where long preser vation is concerned, and to seek for a good dr one, such as the one I have above detaile using my own old honey process for wor nearer home, and where an exalted sensibilit is especially aimed at.

All does not seem to go smoothly with th attempts to produce permanent prints; fo while Herr Pretsch threatens M. Poitevin wit legal proceedings for a trespass on his pate by his process of photolithography, Mr. Fo Talbot again appears on the field as a bel gerent, and in his turn threatens an actio against Herr Pretsch and Co., for an infring ment of his original patent, which includes t use of gelatine and bichromate of potash as sensitive agent.—*London Photographic Journa*

We thank our correspondent, H. P., for draw ing attention to an error in the notice of Mr. W R. Grove's experiments, given in No. 3, of th Journal, Feb. 1, 1857. *Philosophical Transactio* is mentioned as being the journal in which the are given, whereas it should be the *Philosophic Magazine.* In the January number of this pr sent year will be found the paper alluded to.

* Vide *London Photographic Journal*, Jan. 1857, p. 205.

CORRESPONDENCE.

Co the Editor of the Liverpool and Manchester Photographic Journal.

ɜɪʀ,—Should the following be thought worthy of a ce in your valuable columns for the benefit of ateurs, and others, who may wish to colour itive collodion portraits, it is quite at your vice. Having used both frequently, I can assure ı that they will be found quite satisfactory.

st. Add ten grains of good izinglass to one oz. vater; dissolve by placing the bottle in hot water, l well shaking it, filter while warm. Having well hed the collodion plate from cyanide, pour this ; dry the plate before a clear fire, and the al dry colours may then be applied; and by pre- ısly breathing on the plate any depth of colour be obtained. The plate must then be varnished he usual way.

nd. Into a wide-mouthed bottle put some Canada ¡am, and add some spirits of turpentine; let it ıd a day or two, well shaking now and then. Mix w drops of this with one oz. of turpentine; filter ırough blotting paper; then varnish your picture pour some of the mixture on. Let it dry before ear fire. The picture will take the dry colours lily; but if the pencil sticks to the varnish, ease the quantity of spirits.

Yours, truly, C. H. G.

---

o the Editor of the Liverpool and Manchester Photographic Journal.

ʀ,—In my experience of photography, I gene- find the simplest methods of doing things to be best. In salting paper for calotypes, some mmend one kind of salt and some another. I tried them all; but for a long time back I have nothing but *pure sea water*, by which method I r fail in getting good results, with brilliant es and a rich purple black colour. Great care t be taken in the choice of the vessel to contain ¡alt water, as, if iron or tin is used for that pur- , it will be found to spoil it completely. I have rally found a common earthenware jar to be the thing for holding it, and I always use it in a elain bath.—I am, sir, yours respectfully,

Argyle Street, Glasgow, J. RALSTON.
20th February, 1857.

ı the Editor of the Liverpool and Manchester Photographic Journal.

ʀ,—Can you inform me when Mr. Urie's patent out, and also whether the following mode can onsidered an infringement:—Blacking the figure ıe reverse side of the glass, and then putting the e paper on. Mr. Urie says it is; but the same od has been practised a length of time with portraits cut out in black paper, and I do not hy what has been applied for so long to pro- on paper, should be considered an infringement photographs,—I am, sir, yours obediently.,

ıary 28th, 1857. VEXED.

[We shall feel obliged if any of our correspondents favour us with information on the above point. . L. & M. P. J.]

ınt of space in the present number prevents our g answers to several enquiries; but they will be ded to in our next publication.

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T aay seem almost superfluous to draw tt tion to a letter which appears in this u oer, having the well-known signature of o rt Hunt; but the subject there alluded to such paramount interest to the whole ci tific world, that we may well be excused or espeaking our readers' serious attention to The practical fixation of colour is the r dest discovery which now remains to be c eved in photography; rivalling in interest search for the Philosopher's stone, it has point of difference, that whilst in the latter the hopes of the seekers were founded on tal ignorance of the laws of nature, and only buoyed up by the clever audacity of atans and imposters; in the former in- ce the laborious and persevering investiga- of such men as Becquerel, Niepce, &c., d on a careful study of the natural laws ing to the phenomena of colour, have con- ed us of the *possibility* of success, although the present time no one has hit upon the ise mode of effecting it.

e originality of Mr. King's distilled water ervative process, published in one of our nt numbers, is disputed by Mr. Phillips, who es:—"This process was communicated by o the Birmingham Photographic Society in ember last, and for it I had the honour to ive their thanks, and I also advertised it. process Mr. King obtained from me, and r had a right to do as he liked with it, ex- ing claiming my discovery and publishing s his own." Mr. King, in answer, says:— s (Mr. Phillips') statement that I wrote to for his process is correct, I having done so rding to the terms of his advertisement. as therefore surprised to receive a *fac-simile* y own. I immediately wrote to Mr. Phillips, ing that the process he sent I had used al- st identically for some months past, and decided upon publishing the same in the rnals; and as he no doubt found his adver- ment a paying transaction, I should not de to it in any way."

Ve cannot help thinking that from the above dence Mr. Phillips has been treated rather airly. It is an established rule in such mat- s, that priority of publication constitutes rity of discovery, except in very exceptional cases. Now, unless Mr. King can prove, by letters or otherwise, that he was in possession of the process before Mr. Phillips made it known, the latter gentleman has clearly great cause to complain of his discovery being so entirely ignored.

We are enabled to speak with confidence of the beauty and certainty of the collodio-albumen process described in our last number by Mr. Sidebotham; we have met with perfect success by following closely his instructions, and have moreover seen some most admirable little stereoscopic pictures which he has taken. The rapidity, although far inferior to moist collodion, is still sufficient to give all the shadows perfectly sharp, and in some instances figures and animals are taken with as much accuracy of detail as if an instantaneous process had been used. We confidently recommend it to the notice of our readers.

It has always been our earnest endeavour to convey information through the medium of "Answers to Correspondents," in as widely useful a manner as possible; and thus the prominence given to the answers are in proportion to the general importance of the information. In cases where only an exceptional difficulty requires meeting, a few words are sufficient: if the queries are on subjects in which every photographer is liable to mishaps, the space accorded to the answers would be such as to enable general rather than particular suggestions and explanations to be discussed; but if advice and assistance are asked on subjects respecting which the general opinion is, as we think, erroneous; and if from the number of such questions, all bearing upon the same subject, it appears that the error is widely spread; then it becomes our duty to throw greater weight into the answer by removing it from the position it usually occupies, and raising it to the place of honour as a deliberate protest of the "Journal" against error.

It is painfully evident that a very numerous class of our readers do not make sufficient distinction between the mechanical and mental operations in photography; a glance at some of the enormities displayed to public view in our streets—nature tortured into perpetrating a character of herself—will show how few self-styled photographers, even when assisted by Ross' lenses and Thomas' Collodion, deserve to rank higher than mere picture-takers.

The mechanical difficulties of most of the ordinary processes are soon overcome: attention to a few obviously necessary points, together with a steady perseverance in spite of mishaps, must eventually triumph over every

difficulty, (for be it remembered that in commencing the study of any experimental science a good failure is frequently more instructive than the most complete success). But, even supposing the operator to have so perfectly mastered the mechanical difficulties of the art as to be able almost to command success at will; there is yet higher ground to which he must aspire, or he will no more deserve the title of *photographer*, in its true meaning, than a child in a painter's studio playing with the pallette and brushes is entitled to be called *artist.* For in each instance, besides the utmost attainable perfection in what may be called the tool, that instructive discrimination is required in choosing the point of sight and in making the most of the accessories of light and shade which seem to come naturally to the true artist only—a really artistic photographer, like a poet, "*nascitur, non fit.*"

Bearing in mind the defects liable to be introduced by the sphericity of field, want of achromatism, or other imperfections of the lens, and remembering that an optical representation of a raised image on a plain surface must necessarily be distorted, care should be taken, whenever possible, to reduce these errors to a minimum, either by using long-focussed lenses, contracting the aperture, or by paying attention to placing the different parts of the object to be copied as nearly equidistant as possible from the lens.

PHOTOGRAPHS AT THE CRYSTAL PALACE.—A numerous collection of photographs, chiefly by French artists, is now exhibited at the Sydenham Palace: names of the highest rank will be found in the list. M.M. Bisson Frères, who are considered the greatest publishers of Paris, are represented by several fine specimens, chiefly on architectural subjects. A large view of Paris, from the *quai du Louvre*, and various views of the *Palais Royal*, *Place de la Concorde*, &c., may be regarded as types of their class; but they have likewise contributed four unusually large photographs of the glaciers of Switzerland. M. Baldus, of Paris, though less prolific than the M.M. Bisson, is nearly their equal in rank, indeed their three large views of the new pavilions of the *Louvre* are without precedent for brightness, distinctness, depth of colour, and absence of distortion. Some of the smaller works, one representing the havoc made by the recent inundations, were exhibited at the late photographic exhibition at Brussels. So highly are the merits of M. Baldus esteemed in France, that he is at present occupied on a work that will number 1000 subjects, being the entire detail of the new additions to the *Louvre*, with every ornament of sculpture, moulding, or construction. M. Blanchere, of Paris, is represented by several copies of French pictures, and some landscape studies on the banks of the Loire; M.M. Perrin and St. Marc by their views on the Rhine; M. Duboscq by gems and microscopic objects photographed by the use of the photo-electric microscope; M. Delessort, by his reproductions of the rare engravings of Marc Antonio; Count Olympe Aguado, by his studies of the trees at Fontainebleau; M. Le Secq, by his photographs after modern pictures of the French school; Le Gray, by his well known cloud studies, his marvellous reproductions of the "*Jocon*[da]" of *Leonardo du Vinci*, and a portrait by Raffa[elle], and several other works; Mr. Maxwell Lyte, his passes in the Pyrenees, &c. Some views of the remarkable antiquities and edifices of R[ome] have been contributed by Cardinal Wisem[an]. The English photographers are likewise re[pre]sented, and the collection will be much increa[sed] after the close of the present month, whe[n a] large number of the works now exhibitin[g in] Paris will be transferred to the Sydenh[am] Palace. Contributions are likewise prom[ised] from Dresden, Munich, Milan, Florence, [and] Venice. In the same room with the photogra[phs] is an object of singular historical inter[est,] namely, the celebrated Waterloo medal [by] *Pistrucci*, struck from the original die, which [has] never been hardened. That the subject c[on]sists of the four allied sovereigns, surrounded [by] figures representing the mythological war [of] the giants, is generally known; but as, f[rom] various circumstances, impressions of the [die] have been rarely taken, few persons have s[een] this exquisite work of art.—*Times.*

LIVERPOOL PHOTOGRAPHIC SOCIE[TY].

THE third meeting of the present session [was] held at the Royal Institution, Colquitt-street, [on] Tuesday evening, March 17th, but the notic[e of] it not having been forwarded for insertion [as] usual in the *Liverpool and Manchester Ph[oto]graphic Journal*, there was but a limited att[en]dance of members: Mr. BELL, one of the v[ice-]presidents, was called to the chair.

The CHAIRMAN in opening the business of [the] evening, suggested that, few members be[ing] present, the proceedings should assume a c[on]versational form, the experience of previ[ous] evenings having shown that the informal cou[rse] occasionally pursued was frequently more p[ro]ductive of interest, and more suggestive in [its] results, than the more elaborate papers r[ead] before the Society.

Mr. FORREST wished to ask Mr. Berry, or [any] gentleman who had practised Taupenot's p[ro]cess, if he could inform the meeting as to [the] best method of maintaining the efficiency of [the] aceto-nitrate bath, which he found invaria[bly] became impaired after being some time in u[se,] and whether it arose from contamination by [the] albumen, or by loss of acetic acid.* At the sa[me] time he would mention that, in all cases wh[ere] a roughness of surface was visible on the al[bu]menized plate after being sensitized, from [the] formation of oxide of silver, it could be remo[ved] by being rubbed with a small pledget of cott[on,] and in a similar way the striæ that were ma[ni]fested in developing might be removed. [He] believed that the presence of acetic acid in ev[ery] case made the process more or less uncertain.

In answer to a question, Mr. BERRY sugges[ted] that citric acid might be employed in plac[e of] acetic acid, but it was liable to the same obj[ec]tion—that it might by possibility decompose [the] silver bath.†

* The coloration is due to albumen derived from the plate. [Ed. L. & M. P. J.]

† It will not.—[Ed. L. & M. P. J.]

Ir. KEITH exhibited a very interesting speci- n of photography in a picture, taken on an imelled white tablet, which by transmitted ht gave a correct image, of a pure bistre our, and seemed admirably adapted for pic- es, lamp-glasses, transparencies, &c.

Ir. BERRY then exhibited a photographic gative taken by Mr. Maxwell Lyte's new ta-gelatine process, as described in the last mber of the *Liverpool and Manchester Photo- iphic Journal.* Eulogizing the simplicity of process, he considered it superior in its idity to any yet published, the picture exhi- ed having been taken in thirty-five seconds.

Ir. BANNER exhibited his stereoscopic camera, proved on Mr. Marriott's, shown at the first eting of the present session. The chief ints of distinction between the two designs , that in Mr. Marriott's camera the image is ken on the surface of the collodion, by which ans it is inverted, if the collodion film is unted on the outside, as is usual with coloured otographs, while in Mr. Banner's it is taken rough the glass, and the resultant image is n-inverted in the case of a coloured picture; other point of difference being that Mr. nner's camera revolves on an axis, instead being moved on a straight rod, by which convergence of the lenses or lens may be tained approximating to that of the human e. The two cameras having in common,— t. The revolving disc in front of the box, by iich one lens is made to take four distinct ages on the prepared glass, or two complete ereoscopic slides. 2nd. The partition of the x itself into four compartments—light tight— place of the ordinary adjusted stereoscopic umes. The prepared glass is placed face down the rabbet of the frame, and maintained in its sition by a small silver bar closing over at ch corner.

The CHAIRMAN suggested to each member e desirability of saving the refuse deposits in ery process of photography carried on, in hich silver was employed. This recovery of ver from the washings equalled nearly 50 per nt. of the quantity he had used, and he did t doubt that the gain would be equal in most every case, and this was a matter of ecial importance to professional photographers.

Allusion having been made, by Mr. Banner, to e fact that ordinary glazing colours might be plied to photographs for the purposes of louring with frequently considerable effect id without artistic pretension, and by this eans with the preservation of the outline of the iotograph — so desirable in every case for uth's sake — Mr. Berry suggested that it ight be advantageous, in every instance, to ver the photograph with colour, as in case of ding the image would remain unimpaired.

Mr. FOARD remarked that, on the contrary, ie greatest injury in practice was found to ise from the use of body colour employed to ver blemishes in the photograph, to obtain smooth and even surface, as this almost ivariably faded, even when the photograph as unimpaired, the practice of the most minent artists authenticating the use of trans- arent water colours.

PHOTOGRAPHIC SOCIETY OF SCOTLAND.

THE following is an abstract of a very interesting paper "*On the application of Uranium and other Matters to Photography;*" which was read by Mr. Burnett at the last meeting of this society.

"The first class of these experiments is founded on the susceptibility to actinic influence of a paper prepared with the ferridcyanide of potassium, commonly called red prussiate of potash (the process so far being identical with one of the forms of the old cyanotype), and the subsequent action of a metallic salt affecting differently the changed and the unchanged portions of the ferridcyanide.

"Experiment 1st.—A paper prepared with red prussiate being washed, after exposure, with a solution of nitrate of silver, gave a brown, yellow, or red picture, on a bluish ground—of no value.

"Experiment 2nd.—The paper prepared with the red prussiate, being, after exposure, washed with or floated on a solution of the nitrate or chloride of cobalt, will give a purple or brown purple impression on a greyish or bluish ground, the colours varying within certain limits according to the strength of solution and other circumstances, and the pigments in this case being ferridcyanide of cobalt, Co Cy, Fe 2, Cy 3; and the ground probably the Co 2, Fe Cy 3, mixed with varying proportions of a prussian blue, according to the stage at which its decomposition by the cobalt solution has been arrested. This, and similar processes producing coloured impressions, though no step towards the much aspired after colour printing, understood as the getting of each ray of the spectrum to leave on the paper an impression which will reflect itself and no other, will yet suggest the idea of a certain sort of coloured photography. Not to allude to the possibility of adding the complementary shades by hand or otherwise, and of producing more than one colour by a combination or succession of differently acting chemicals on the paper, it is obvious that, in the case of one-coloured objects, supposing us to have at our command a variety of processes yielding as many different colours, we may select our process according to the colour we wish to produce.

"To return to our cobalt process, which suggested this digression, it might, for instance, should it turn out permanent in its results, give us the means of re-producing the floridæ, or red sea-weeds, with such an approach to their natural complexion as might be valuable to the student of marine botany.

"By steeping the cobalt photographs in a solution of carbonate of ammonia, we may modify to some extent the colour, giving the purple a more rosy hue, prolonged exposure to brilliant sunshine having, however, a tendency to restore the purple. The ground also undergoes some change. By using a paper prepared with the ferrocyanide, or yellow prussiate, mixed with an acid, instead of the red salt, we get very similar results. I have got photographic indications with the ferrocyanides along with some of the other metallic salts. I have not, however, with the exception of uranium, yet had any presentable results.

"The next class of processes are dependent

on the sensitiveness to light of the salts of uranic oxide or sesqui-oxide of uranium, U_2O_3.

"In the first process, the paper being charged with the uranic salt, and exposed to the solar influence under the negative to be copied, is washed with a solution of the ferridcyanide or red prussiate of potash. The "Harvest Scene" in the Exhibition, being from an albumen negative, very obligingly lent me by Mr. Ross, of Messrs. Ross and Thompson, the well known Edinburgh photographers, is an example, the salt of the sesqui-oxide of uranium being in this case the hydrofluate, and the time of exposure from the strength of the albumen negative, fully an hour of good sunshine. I have used for the solution of the uranic oxide for this process a variety of acids with very similar results; the sensitiveness of the prepared paper to light, however, varying much. For instance, a collodion negative with the hydrofluate paper, produced a very good print in half an hour of unsteady sun, while with a paper prepared with the tartaric acid solution of the oxide, it gave an equally good impression in less than five minutes of the same intermitting sunshine, indicating thus a difference of sensitiveness of 6 to 1 in favour of the tartrate. The rationale of this process is the reduction of the sesqui-oxide of uranium U_2O_3, on those parts of the paper exposed to the solar influence, to a lower state of oxidation, the protoxide UO, the salts of which have the property of forming with the soluble alkaline ferridcyanides a rich chocolate brown precipitate, while the salts of the sesqui-oxide are destitute of this reaction. Hence the brown deposit on the parts of the picture on which the sun has been allowed to act when the developing solution is applied, and the absence of any such appearance on those parts which have been protected from his influence. As to the manipulatory details of this process, the paper (Canson's is what I have used), should be floated on the solution of nitrate, tartrate, or other salt used, in a dark room and hung up there to dry, and then preserved from light in a portfolio. If carefully secluded from light it appears to keep well. After exposure for the proper time under the negative, there is in some cases scarcely any visible impression, while in other cases, particularly when using the tartaric acid solution, I have found the impression very distinguishable of a brownish or blackish shade, although still quite faint.

"The development is best conducted by floating it, anything like rubbing the picture being very objectionable. I use a quite strong solution of the red prussiate, but if kept from daylight and any sediment occasionally poured off, and more of the red prussiate added if it becomes weakened, it will serve for a good many developments.

"When the picture has fully come out, which is generally in from three to ten minutes at the very most, it is removed from the developing bath, placed in cold water, and washed very gently for a few minutes, the water being frequently changed till it ceases to acquire a yellow tinge from the dissolved red prussiate. The picture is then drained from the water, pressed between folds of blotting paper, dried in the dark, and the process is complete.

"During every stage of this process, from th first preparation of the paper till the completio of the picture, except when under the negativ in the pressure-frame, it should be kept carefull secluded from light, for, though not so delicatel susceptible of injury from a straggling ray a the calotype paper, or as this same paper whe employed with some of the developers I sha afterwards describe, it will be soon found tha neglect of such precaution, at any stage, will b likely to affect unfavourably the final result. I is well also to mention, that in this process no only do we cease to gain, but the print may b seriously damaged by too long exposure in th pressure-frame, the parts which ought to hav been the darkest assuming, in this case (as the dry after the development), a sort of ochrey o clayey appearance, quite destructive of all beauty This, the only difficulty attending the proces is not however very difficult to avoid, at a events after one or two trials, which may b made by small slips of prepared paper, an the results of this process, when well conducte are for many purposes (copies of sculpture fo instance), of a very pleasing kind. I may stat as one recommendation of this process, that an brown stains left by it on the fingers or els where are at once removeable by a little wea ammonia, or soap and water.

"There remains but one class of uranic pho tographs to be described, namely, that obtaine when we develop with a salt of silver or gol (or platinum ?). This class may be made to prin much more rapidly than our ordinary silve printing process, approaching sometimes mor nearly to the calotype development in this re spect. We get the *minutest details* with gre fidelity, and the picture is effectually fixed b simple fresh hyposulphite solution, with a goo colour in many cases (at all events as may l seen in the exhibition), or by ammonia, whic will be considered an advantage by those wl hold the hyposulphite an enemy to durabilit Different shades of colour are produced accor ing to different solvent acids and different detail I have got a good black, perfectly like that an engraving, by the nitrate of uranic oxid developed by ammonio-nitrate of silver (or pla nitrate), and fixed by plain hyposulphite wit out any colouring bath. One in the Exhibiti was so manipulated in May last, and still show no signs of decay. I have also obtained prin of blackish grey, or red grey, changing into pu grey, by exposure to an hour or two of sunshi by preparing and developing in the same wa and fixing by a weak ammonial solution.

"I have experimented with uranium devel ment on a considerable variety of the ura oxide salts. I name the following: nitra hydrochlorate, oxalate, formiate, benzoate. h drofluate, succinate, tartrate, ammonio-acetat and citrate, which is, in some respects, a very co venient salt. The uranic oxide dissolving the citric acid solution with remarkable ea and the silver salts which result from t mutual decomposition being insoluble, ma in some respects, be a convenience. T nitrate and the tartrate, among others, gi very pleasing results. On paper prepared wi the uranic nitrate solution, (the strength bei 40 to 50 grains to the ounce of water,)

tained a very distinct copy from a collodion gative, developing by nitrate of silver, after teen seeonds' exposure to sunshine, or conlerably better filled up by ten seconds of posure, by adding to the nitrate of silver veloper a small quantity of the proto-sulphate iron solution with acetic acid, or of gallic and etic acid mixed. The silver, with protolphate, or other proto-salt of iron solution, plied to a longer exposed paper gives a ry intense deeply-printed blaek. Impressions ferns have been developed on the uranic rtrate paper, after exposure to gas-light, not ly by silver solutions, but by the ferridanide, and as this latter developer requires e aetion to have gone on mueh farther before y very decided symptoms of aetion are perived, this tartrate paper might perhaps prove nsitive enough to be available for the camera. e saw already that the tartrate was much ore sensitive to light than the nitrate, and I spect that some of the other salts possess yet eater sensitiveness. I have not yet got the omide and iodide brought fully to proof, but intend giving them a trial with eollodion and bumen. It would be interesting to observe hether the aetion of light on the different anie salts bears any relation to that on the lts of silver, or, what is much more probable, ferrie oxide with the corresponding aeids; it the most interesting relations remaining to examined is perhaps the action of the differtly coloured rays of the spectrum on the anium salts. I have not yet been able, from ant of convenience and apparatus, to come to y very decided conclusion as to these actions, it it is very important that a minute investiition should be made of the relative suseeptilities of the different portions of the speetrum, all substances which give any promise of ing suffieiently sensitive for use in the camera. very one is aware that the great diffieulty in presenting foliage in landscapes is owing to e unequal actions of the higher and lower rtions of the spectrum on the silver salts, and is only by the systematie prosecution of such quiries as we allude to, that we may hope to it upon some substance more equally acted on by the differently coloured rays, or acted sufficiently by the green rays, to enable us work with them by themselves.

HOTOGRAPHIC EFFECTS OF LIGHTNING.

T a meeting of the Meteorologieal Society, Tuesday evening, the 24th ultimo, a paper as read on a phenomenon whieh really seems ineredible that were it not for the very umerous and high authorities who have given thentic aeeounts of the several oceurrences, e should hesitate to lay the following abstract, uoted from the *Athenæum*, before our readers:— *On the Photographic Effects of Lightning*," by ndrés Pocy, Direetor of the Observatory at avanna. The first (though not the earliest) uthentie mention of this singular phenomenon as made by Benjamin Franklin, in 1786, who equently stated that about twenty years preious, a man, who was standing opposite a tree at had just been struck by a thunderbolt, had n his breast an exact representation of that tree. A similar case is mentioned by the *Journal of Commerce*, New York, on the 26th of August, 1853:—'A little girl was standing at a window, before whieh was a young maple tree; after a brilliant flash of lightning a complete image of the tree was found imprinted on her body. This is not the first instance of the kind.' M. Raspail, in 1855, has also mentioned another instance;—He says, that a boy elimbed a tree for the purpose of robbing a bird's nest, the tree was struck, and the boy thrown upon the ground—on his breast the image of the tree, with the bird and nest on one of its branehes, appeared very plainly. Sig. Orioli, a learned Italian, brought before the Seientific Congress, at Naples, the following four cases of impressions made by lightning:—In September, 1825, lightning struck the foremast of the brigantine St. Buon Servo, in the Bay of Arriero; a sailor sitting under the mast was struck dead, and on his baek was found an impression of a horse-shoe similar, even in size, to one fixed at the masthead. On another oeeasion, a sailor, standing in a similar position, had on the left of his breast the impression of a number 44, with a dot between the two figures, being in all respeets the same as a number 44 that was at the extremity of one of the masts. On the 9th of October, 1836, a young man was found struck by lightning—he had on a girdle with some gold eoins in it, these were imprinted on his skin in the same manner they were plaeed in the girdle, thus a series of circles with one point of contaet were plainly visible. The fourth ease happened in 1847. An Italian lady, of Lugano, was sitting near a window during a thunderstorm, and perceived the eommotion, but felt no injury; but a flower which happened to be in the path of the electric current was perfectly reprodueed on her leg, and there it remained, permanently. Mr. Poey eoncluded this part of his paper by an instance mentioned by him in his 'Memoir on Lightning Storms in Cuba and the United States.' On the 24th of July, 1852, a poplar tree, in a eoffee plantation, being struek by lightning, on one of the large dry leaves was found an exact representation of some pine trees that lay at the distance of 339 mètres (367 yards 9 inches). As to the theoretical explanation of lightning impressions, Mr. Poey thinks that they are produced in the same manner as the electrie images obtained by Moser, Riess, Karsten, Grove, Fox Talbot, and others, either by statieal or dynamical electricity of different intensity. The fact that impressions are made through garments is easily aceounted for, when we remember that their rough texture does not prevent the lightning passing through them with the impression it has reeeived; to eorroborate this view, Mr. Poey mentioned an instanee of lightning falling down a chimney and passing into a trunk, in whieh was found an ineh depth of soot, which must have passed through the wood itself."

ERRATUM.

In Mr. Lyte's Meta-gelatine Process (page 64)—in the proportions given for eombining the syrup the quantity of honey is stated as *two* drs. by weight, it should have been *four* drs. by weight.

CORRESPONDENCE.

ON THE PRODUCTION OF NATURALLY COLOURED PHOTOGRAPHS.

To the Editor of the Liverpool and Manchester Photographic Journal.

Dear Sir,—Notwithstanding the perfection to which we have arrived in the production of photographic pictures within a few years, I cannot but regret the almost entire absence, to all appearance, of any original research into the phenomena—physical and chemical—which are involved in the production of those pictures. Our photographic artists, armed with a good camera obscura, and supplied with choice chemicals, have but to master the difficulties of manipulation (they are not many) and results are obtained which, proving satisfactory, render them content to work on without further inquiry.

In looking over the Exhibition of the London Photographic Society, one cannot but be struck equally with the truth and the "untruth" of photography. Beautiful as are the pictures which the photographers are exhibiting, any student of nature must discover the failure of the art in producing correct representations of coloured objects. In 1840, M. Biot writes :—"The hope to reconcile not only the intensity, but the tints of the chemical impressions produced by radiations, with the colours from which these radiations emanate, is an illusion;" and in 1857 the French philosopher might almost have written the same words, if he formed his judgment from the pictures which have been presented to the world. I have ever expressed my opinion that the chemical impressions produced by the radiations from coloured surfaces, might be made to harmonise with the *lights* which belong to those surfaces,—that, for example, the photographic picture which should represent a person in robings involving the colours yellow, green, blue, red and violet, should, by its *lights, middle tones, and shadows*, faithfully convey to the eye of the observer a sense of brightness and obscurity corresponding truly with those coloured radiations.

An examination of this problem naturally opens upon another—*Is it possible to produce photographs in all the beauty of native colouration?* Can we not enlist a few earnest enquirers in this direction? The probabilities of success may be remote, but the reward of such a discovery would be great. However, if such an investigation did not result in the discovery of a sensitive surface which would give coloured images, it would teach us how to reconcile the tones of a photographic picture more nearly to the tints of nature.

Let it not be forgotten that Herschel obtained coloured impressions of the solar spectrum; that Becquerel procured coloured pictures by the camera obscura of geological maps and the like; that Niepce de St. Victor has exhibited his naturally coloured pictures, and taught us how to obtain them.

My own experience enables me to state, that under some circumstances the chloride of silver will become coloured by a coloured ray; that the fluoride of silver frequently exhibits the phenomena of colour; and that the salts of barytes possess peculiar colorific properties. *(See Researches on Light, 2nd edition.)*

With iodide and chloride of silver the photographer appears contented, and certainly those salts answer the ends of producing the best of the photographs which we now see. Something more than this is desired, and with the hope of enlisting some young and earnest photographer in this line of research I have ventured to trouble you with these remarks.

What appears desirable is that experiments should be made by receiving impressions of a great variety of coloured surfaces of the same colour, produced b[y] different chemical agents, and of dissimilar colour upon daguerreotype plates prepared by all know[n] methods and modifications of th[e]m, upon chloridate[d] papers made with different chlorides, on calotyp[e] papers into which salts other than the ordinary on[es] enter, and on collodion plates varied as much [as] possible in their chemical characters.

There is something delightful in producing a go[od] photograph, but there is something far more satisf[y]ing in making a discovery which shall advance t[he] art. To make discoveries we must walk out of t[he] beaten track, and the more divergent the roads ma[y] be along which investigators choose to tread, t[he] greater will be the prospect of a full solution of t[he] problems which I have ventured to indicate.

I am, sir, yours, &c.,
ROBERT HUN[T]

To the Editor of the Liverpool and Manchest[er] Photographic Journal.

Sir,—I should feel obliged by your permission [to] make a few remarks on the photographic arrang[e]ments for the forthcoming Art Treasures Exhibiti[on]. The first official announcement to photographe[rs] that such an exhibition was to take place, was mad[e], I believe, on the 21st of February, through the *Lond[on] Photographic Journal.* That announcement defin[ed] the 16th of March as the last day for recei[vi]ng contributions. Twenty-three days are consequen[tly] allotted for the production, framing, packing, a[nd] transmission of specimens; and forty-five days, [*] till the 1st of May, to arrange them after recei[pt]. These forty-five days represent official manageme[nt] and resemble the six weary miles from Balaklava, much more difficult to traverse than the entire p[as]sage from Southampton to the Crimea. Why [are] photographers to be deprived of their pictures forty-f[ive] days before, and longer than they are needed? W[hy] are 23 days only allowed or considered necessary [for] the production of specimens to represent, material[ly], the photographic art of to-day, on so important [an] occasion? The council may desire few photograp[hs], be careless about their quality, or receive t[he] contributions of but a favoured few; but on a[ny] other than one of these grounds, the arrangem[ent] seems, to say the least, anomalous. It mig[ht] naturally be supposed that with the stimulus of su[ch] an exhibition, great exertion would be made to fu[lly] and truly represent the art, and that special lab[our] would be, in many instances, undertaken for t[he] purpose: photographers, especially amateurs, do n[ot] keep their best efforts prepared for every emergen[cy]. In many public exhibitions of note, too little ti[me] has been allowed for preparation; but on this occasi[on] with greater need of time, less than usual has be[en] allowed. Beyond this inconsiderate restriction, [the] notice contains a recommendation and a stipulati[on] not less injurious and objectionable. The fi[rst], that white mounts should be used for every pict[ure]. Now apart from the disagreeable uniformity o[f a] large number of white mounts being collected [to]gether, it is well known to artists that, in m[any] cases where colour is concerned, and in a g[reat] number of instances where it is not, a white mo[unt] is ill suited for the purposes of display, and tha[t a] tinted one is in all respects superior. It certai[nly] appears singular that the committee should rec[om]mend what experience has proved to be wrong. T[he] stipulation is, that every picture is to be forwar[ded] to London for examination. It is certainly pr[e]evident that the Manchester committee write the[m]selves swamped at this stage of the proceedings, a[nd] incapable of proceeding further by themselves;

* We announced the intended exhibition a week earlier t[han] the journal here mentioned.—Ed. L & M. P. J.

surely they might have devised some less expensive expedient of sifting, than that which declares it necessary that Manchester and Liverpool pictures, as well as those of all the North of England, should be sent to London to be accredited and then returned. No ministerial mismanagement ever equalled this, indeed I should think nothing on record, save that chronicled in Gotham, of the cow dragged to the house-top to eat the grass which should have been cut and thrown down.—Your obedient servant,

S. C. B.

Manchester. March 21, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—I find upon reference that Letters Patent were granted to Mr. J. Urie, of Glasgow *for the term of fourteen years*, bearing date 20th Feb. 1854, unless the said grant should be allowed to lapse by reason of the nonpayment of the requisite stamp duties, viz. at the expiration of the third and seventh years, in which instance the invention would become public property. The inventor claims "a mode of coloring or tinting the backs of photographic pictures on glass, and a mode of producing in them an appearance of relief, by placing a black, opaque, or other back-ground on the back of the plate;" but the subject matter of the invention is altogether so very questionable that any opinion other than that of a Court of Law would be of scarcely any use to your correspondent, or I should have been prompted to have offered mine.

I am yours respectfully,

Ignis via et Nunquam Animus.

Manchester, March 10*th*, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—In reply to the inquiries of Mr. Elliott, I have to say that the nitrate bath I use is in a very slight degree acid; and that I used collodion made in accordance with the formula which was given in "Notes and Queries" about three months ago, by Dr. Diamond, and which I find sufficiently negative for out-of-door practice, more especially in the process I was so fortunate as to discover; and for positives I know of none superior. I should suppose that any of the collodions generally used would answer equally well; but of this, of course, I cannot speak positively. As regards the dryness of the plates, treated in the way I treat them, I find that they are, at the expiration of a week, in the slightest degree adhesive, or perhaps sticky is the proper word, and to this, I conclude, is to be attributed their retaining sensitiveness so thoroughly, for even after a fortnight I find they are as sensitive as collodion used fresh. It is right to add that at the end of a fortnight crystallization has commenced on the surface, aud they are thus rendered unfit for photographic purposes, although perfectly sensitive; but as a week seems long enough to me I do not care much about the matter. What particular advantage can accrue from the plates being absolutely dry, I am at a loss to know, as surely they are not to be handled, or subjected to any other rude treatment. I consider, that having found they will retain perfect sensitiveness, sufficient dryness for any requisite purpose, and that there is not any risk of failure, nothing better is required; and I believe that it will prove a very valuable acquisition to photography.

I would wish to add, that I think it safer when first beginning the development, not to add more than two drops of silver to one-third of an ounce of the pyrogallic, as if much exposed discoloration of the picture might probably ensue; and after the positive is well out, to add five or six drops more of the silver to strengthen the negative. And I have found that five minutes' exposure produces a positive, and seven minutes a good negative, in sunny weather.

I last week took out seven plates, and every one turned out excellent, a circumstance never attending any other preservative process in my hands. And where distilled water is obliged to be used, it may be worth knowing that the same dish of water will serve for many plates—a dozen, without any ill consequences; and as after being in the dish they are well washed, the sugar does not become in any way deteriorated. I nevertheless occasionally filter the solution, so as to be quite sure.

Trusting I have given the information desired by Mr. Elliott,—I am, Sir, your obedient servant,

T. L. MERRITT.

Maidstone, March 5*th*, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

Dear Sir,—I have so much reason to be pleased with the formula given in your foot note of the last number but one in the *Journal*, that I imagine you will be able to solve a difficulty which some of my photographic friends have been unable to explain.

The first plate, 11 × 9, prepared by this formula, was as fine a negative as I could desire to possess. The next, prepared four days after from the same batch of collodion, presented the same appearance that has harrassed me more or less for the last two years, viz.:—that while wet, the blacks are even enough; but so soon as it dries, the sky and all the black parts split up into minute cracks, presenting all the reticulated appearance of a cobweb, or rather fine crape. As Mr. Fitt suggested it might arise from the presence of water, I procured ether and spirit as nearly anhydrous as they can be obtained, insomuch that I find a difficulty in getting the amount of bromide to dissolve in it.

I have tried every variety of pyroxyline, and immersing the plate whilst the collodion was yet moist and nearly dry, but the same effect most frequently ensues.—I am, dear sir, yours truly,

CHARLES COREY.

5, *Slater Street, Liverpool,*
17*th March*, 1857.

[There are several ways in which a somewhat similar appearance to the one mentioned above may be produced. The most likely cause is the presence of water in the collodion, introduced with the ether or alcohol. At first this might not be sufficient to interfere, but, after being used once or twice, the ether and alcohol evaporating would leave more and more water until the exact appearance complained of would be the inevitable result. The obvious remedy is to employ the alcohol and ether nearly anhydrous. The ether should be washed, and then re-rectified from dry caustic potassa to deprive it of the water which is introduced by washing; this is most likely the means by which water enters collodion, as few but the most respectable and largest firms take the trouble to purify the ether in this way. The alcohol should be made nearly absolute by rectification from pure caustic lime.

Another cause is the employment of an insufficient amount of alcohol, as then, if there is the slightest delay between coating the plate and immersing it in the bath, the film dries and produces lines across the plate.

If, also, the collodion be nearly anhydrous, and the proportions of ether and alcohol are correct, a somewhat similar effect may be produced by allowing either too long or too short a time to elapse between coating and immersion; in the former instance the coating will be thin and irregular, and the iodide of silver will be almost entirely on the surface of the film; in the latter case the xyloidin will be partially precipitated by the water in the bath, and consequently have no adhesion to the plate.

The cause first alluded to is by far the most probable one; and, notwithstanding our correspondent has turned his attention to that point, the description of the appearance is so similar to what would be produced by a little water, that we are inclined to suspect its being the true cause in this case.—Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—In commencing this note of enquiry, I feel, from the patience you have exhibited in the explicit information you have given through the medium of your photographic paper, that apology for the liberty I have taken is unnecessary, and but a point in etiquette. You will, therefore, I trust, connive at the abrupt manner in which I address you.

I should feel especially obliged if you would kindly explain in your Journal, the cause and remedy for an annoyance to which I have been subjected for a considerable time, viz.—that of innumerable stains, of a bright green, or rather blue tint, very intense, and which to me in many instances appear to have shewn themselves on the withdrawal of the plate from the nitrate of silver (positive) bath. On giving to the developing solution, whilst in the act of developing, a rapid motion, I have found that frequently the stains were not so local or situated in patches, as was the case when such motion to the fluid was not given; but in lieu thereof the green tint was evenly spread throughout the whole picture, as well on the back ground as on the object.

In all cases where the said stains exist, the part is considerably more transparent than it should be.

I feel certain no fault exists in washing the plates after development, as that I have done copiously and in the extreme without better success.

The annoyance made its appearance whilst I was using the very same chemicals, and manipulating with the same care which I had exercised when I obtained very good and satisfactory results.

The whole of the chemicals I have changed and obtained from different establishments time after time, but with the same failure.

I have conversed with many photographers, all of whom declare they are perfectly ignorant of the existence, and of course of the cause and remedy, of green patches. I have also obtained books advertised in your Journal, which treat of failures, stains, &c., but they speak not of green stains.

Your kind attention will extremely oblige,

Sir, yours obediently,

WM. THOMPSON.

[Neither we, nor any of our photographic friends, have ever met with the annoyance here complained of. From the little apparent connection between the cause of the stains and the purity of the chemicals, we are inclined to think some of the formulæ are at fault, and perhaps were they forwarded we could at once point out the source of error. We insert the letter, in the hope that some of our readers will enlighten us on the subject.—Ed. L. & M. P. J.]

Owing to the continued increase of advertisements we intend to give four additional pages of matter in our next publication. A permanent increase of our space is under consideration.

ANSWERS TO CORRESPONDENTS.

R. W. Forster (Whitehaven.) — Our correspondent's interesting letter is in type, and will appear in our next publication.

A Subscriber.—1. Photographs for the microscope are obtained either by using a lens of a short focus, and removing the object to a considerable distance off, or by copying the picture first obtained, and then re-copying this in the camera, thus reducing it gradually; the objection to the former mode is that unless the atmosphere is very clear, the brilliancy of the picture is likely to suffer, whilst in the latter case the sharpness is injured each time of copying; either method may be used according to the subject; the focus should in all cases be ascertained by means of a lens. 2. So long as the developing solution in the collodio-albumen process keeps colourless and clear, it will serve to develope the pictures; but we confess that it is very seldom that we can make the same mixture of gallic acid and nitrate of silver serve for more than one plate.

An Amateur.—Add a little of your solution of chloride of gold (one or two drops), and it will give you the desired effect. Mind and pour the solution of gold into the hyposulphite with constant stirring; the black precipitate you mention is doubtless owing to the hypo having been poured into the gold.

Charles W.—Cadmium will answer better than silver for removing the colour from collodion, but if iodide of cadmium were employed in the first instance you would never have any liberation of iodine.

Aperture.—A 1 inch aperture is too large for ordinary use with a 14-inch landscape lens whatever may be its diameter; try ½ an inch.

Xylo.—It is very evident that light gets into the camera. Remove the lens, and after having inserted the plate-holder take the camera into the open air and look into it, (of course preventing side light from entering the eye by means of a cloth), you will thus see where the hole is, as it must be of a tolerably good size to give such a mark.

K. L. M.—The acid mixture is by far to strong; try the formula given in No. 5.

Photo.—It is a most difficult thing for a beginner to work with a neutral nitrate of silver bath. We should recommend you, at all events to begin with one *faintly* acid.

W. B. (Tyldesley.)—There are very good formulæ for positive collodions in many of our former numbers. The one given in page 52 by Mr. M'Lachlan is spoken of very highly.

J. B. (Manchester.)—We have never used the particular make of chloroform varnish you mention, but it must be very impure to eat away the picture. Try if it contains free chlorine, by putting into a bottle of it a small piece of blue litmus paper; if it is bleached it shows that chlorine is present, which would at once explain all. Try the crystal varnish: if obtained from a good maker it is excellent; or Taupenot's albumen varnish, described in the Journal of the Photographic Society, vol. ii. p. 222.

Chiaroscuro, (Birkenhead.)—You will find some of your queries answered in our last number. For the rest we advise you either to consult some professional photographer, who would give you the desired information, or get one of the pamphlets which treat of the art.

CONTENTS. PAGE.

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AN "ARCHER'S REGISTERED FOLDING DEVELOPING CAMERA," for working Plates up to 9 × 7, in the open air; complete, with water-tight Baths, Bottles, &c. EQUAL IN EVERY RESPECT TO NEW, being not even Soiled. Cost £9 9s.; Price, £8 8s.

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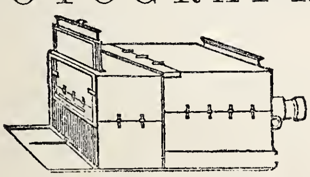

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

EDITED BY WM. CROOKES, ESQ., 15, STANLEY-ST., BROMPTON, LONDON, S.W.

Published on the 1st and 15th of each Month.

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The

·verpool & Manchester Photographic Journal.

New Series. No. 8.—APRIL 15, 1857.

ɜjoice to find symptoms already of return- umbs from the bread cast upon the waters bert Hunt, in our last number. In our ; of the Manchester proceedings are some and suggestions thrown out by one who vidently approached the subject from a ·nt point, and with wider mental grasp s usually given by physical philosophers, ;oo often forget that there is a *science* of graphy, which has been hitherto kept ɔh in the background as the *art* has been ously advanced.

are enabled, by the kindness of Mr. ɜ and the Rev. J. Barlow, Secretary of the Institution, to present to our readers the lecture which was delivered in the theatre Institution on the 13th of February last. cturer having both watched the progress ·tography from almost its commence- and practically experimented in some of ·ints therein mentioned, may well be ed as an authority in such matters; and ıe lecture, as well as being of great pre- terest, when the subject is exciting such attention, deserves recording as a suc- historical statement of the various ·ts which have been made from time to r the accomplishment of "that important n, the certain perpetuation and cheap lication—by means of printers' ink and dinary printing process—of the images ıral objects, as obtained in the camera ı by the process of ordinary photography." he same stronghold of science, on the ·t., the Rev. Secretary himself gave a ıteresting lecture on a subject which will ıg attract great public attention. Mr. Gaine has discovered the remarkable at by a momentary immersion of paper ng sulphuric acid diluted with half its water and allowed to cool, and then ly washing it free from acid, first in of water and then in weak ammonia; it s endued with such extraordinary y, that whereas a band of the original of about an inch in width, breaks under ;ht of seven or eight pounds, in its condition it will support upwards of a l-weight. The lecturer stated that De La Rue & Co. had entered into an ·ment with the discoverer to introduce ɔommerce, where, from its almost inde- ·ility, it will doubtless supersede parch- ı many of its applications. Specimens avings were exhibited which had been so treated *after* having received the impression; the acid having in no way injured the lines of the engraving, whilst the great contraction which the paper undergoes, gives a delicate softness and sharpness to the picture. Several photographs were likewise exhibited which had been printed on this parchment-paper, as it is called, the peculiar hard nature of the surface enabling photographers, the inventor states, to obtain beautifully rich tones with a far less expenditure of nitrate of silver than at present.

On seeing the really wonderful change which had by this simple means been wrought in an engraving, the thought instantly occurred to us, what would be the effect of treating a finished photograph in this manner? We know of many instances in which a strong acid exerts apparently less energetic actions on bodies than the same acid diluted; and it was just possible that the metallic compound, whatever it may be, constituting the dark part of a positive paper photograph, might pass unscathed through the ordeal; the idea was at all events well worth putting to the test of experiment, and accordingly that same night, strips of photographs selected as samples of different tones of printing and various kinds of paper, were passed through the acid according to the plan above stated. The result was one which we certainly had not anticipated; the colour and tint of the picture, even in the most delicate half-tones, remains intact, while the powerful, yet uniform contraction of the paper, adds considerably to the sharpness; the paper is besides suddenly gifted with such great strength, that not only will it bear the roughest handling during the washing operation, without even the possibility of tearing it; but at any after time, when finished and mounted, it will bear hard rubbing with soap and water and a wet cloth, without the slightest roughening or abrasion of the surface, if it be sufficiently dirty as to render such a mode of treatment advantageous. Added to this, the surface (of an unalbumenized print) assumes a peculiar glossy appearance, giving a richer finish to the picture, without the glare which is so much objected to in albumenized pictures. Another effect, which time alone can decide whether or no it may be added to this long list of advantages, was this: a picture which was fading rapidly was so treated on one half only; there was a powerful odour of hydro-sulphuric acid evolved, and certainly there has been no further fading since, although the short space of time which has elapsed since trying the experiment, makes it difficult as yet to appreciate any difference between the two halves as regards their intensity.

A system of exchanging photographs has recently been organized by some members of the Birmingham Photographic Society, which we would gladly see more generally adopted. Pictures are sent per post, or otherwise, to the secretary, accompanied with the name and address of the sender, and postage stamps to pay for a return packet. Once a month the committee intend to allot to each member photographs of an equal quality to those transmitted; and a register will be kept in which will be entered the numbers, subjects, name and address of each sender, and the names of subjects exchanged. There is only one drawback: whilst we are sure that the committee will perform their difficult task with perfect honesty, we fear that it will sometimes be difficult to convince an amateur of that; as his own picture will necessarily far excel, in his partial eyes, that which has been returned as an equivalent for it. They will inevitably be accused of favouritism, and an accusation of that kind will be far easier made than answered.

Liverpool Photographic Society. — The next Meeting of this Society will be held on Tuesday evening, April 21st, 1857, at the Royal Institution. Mr. Glover will exhibit his patented novel applications of photography to manufacturing purposes; and Mr. Keith will read a paper on the Positive Collodion Process.—Wm. Keith, *Secretary*.

Warning to Photographic Artists.—Our photographic friends will do well to take warning from the following extract from a Cape paper, in which it is stated that Dr. Atherstone, an eminent photographer, had nearly poisoned himself:—"It appears that, in removing the stains of nitrate of silver from his hands with that deadly poison, cyanide of potassium (the plan commonly adopted by photographers), he suddenly felt a glow through his whole frame, accompanied by a tremulous feeling. The thought instantly flashed across his mind that some of the poison had been absorbed by some scratches or cuts on his hands which he had forgotten. He washed his hands instantly, taking ammonia and wine. But the symptoms increased; his sight grew indistinct, his memory was impaired, and a sense of fainting warned him that a poisonous dose had been absorbed. He then tried cold affusion, with temporary relief; and a powerful shower bath gave him great relief for a time, but the symptoms returned at intervals of a few minutes; the jaws fell constricted, and there was a spasmodic action of the muscles of the arms, parched throat, and the sense of faintness. In three hours these symptoms left, and he fell asleep. The next day he suffered from great exhaustion. This case shows the necessity of extreme caution on the part of photographers and others in the use of this highly poisonous salt. The following will be found a safe and equally efficacious mode of removing the stains of nitrate of silver from the hands:—Moisten the stains with a saturated solution of iodide of potassium in water, and afterwards with nitric acid, diluted with two parts of water, then wash in a solution of hyposulphite of soda."—*Madras Spectator*.

MANCHESTER PHOTOGRAPHIC SOCIET

The usual meetings of the council and mem were held at the rooms of the Philosophica ciety, on Wednesday evening, the 8th of A Mr. Neville was in the chair at the former the Rev. W. J. Read, M.A., F.R.A.S., pre at the latter.

After passing the minutes of the last mee letters were read from the Literary and I sophical Society, from the Liverpool Phot phic Society, and a circular containing the and regulations of the Photographic Exch Club connected with the Society at Birming The Secretary reported that he had transm to Mr. Archer £34 16s., the amount subsc by the members of this Society, and read gentleman's acknowledgment, as follows:-

"105, *Great Russell-st., Bloomsbury*, W
"*6th March*, 1857.

"Sir,—In reply to your letter received morning, I am at a loss to express my sense o high compliment paid to me by the memb the Manchester Photographic Society, by electi an honorary member of the same, and in l still further shewn their appreciation of the value of the collodion process in photograph the testimonial they have so promptly raised. is highly gratifying to me, as few men live to s general application of their discoveries, and still to have them so generally acknowledged.

"I must beg you to thank the members o society for the honour they have thus done m to assure them that if health and leisure a mitted me, I do hope, with the humble m possess, still further to advance the art of photog

"I have the honour to be, Sir,
"Yours faithfully,
"FREDERICK SCOTT ARCH

A letter was also read from the Secret the Royal Society, in reply to an appli for a copy of Padre Secchi's representa the lunar crater Copernicus, stating that photographs are now distributed, and ar photographs of a drawing, and that it is engraved for the Royal Astronomical Soc

Mr. Sidebotham called the attent members to the subject of producing na coloured photographs, and made the fol observations thereon:—

"A letter in the last number of the *Li and Manchester Photographic Journal*, from Hunt, calls attention to the subject of na coloured photographs, and suggests that ments should be tried by ardent photogr As photographs in their natural colours be so vastly superior to anything we present produce, it would be well if eve tographer would lend his assistance to such a desirable result. In the ordinar dion positives on glass we occasional with examples of partial natural colouri for instance, as a green tinge on the foli have had one where the green and red i tograph of some scarlet geraniums were t bright, and I have here on the table a lar with trees and a red brick house, taken i sunshine, and you will see the green foli the red house are tolerably well marked i

"These effects, poor as they are, a pleasing, but unfortunately they appe dental, and we cannot re-produce them

"It appears to me that, as a basis to any

s, we should study well the photographic ring of nature, and endeavour to ascertain we can in any degree copy the colours. n our fields we see flowers of the most bril- colours produced by the action of light on olourless secreted fluids which are obtained the earth and the air; we see the green leaves the flowers, consisting of several colours, one stem, and in some cases we have all olours combined in one plant. ellow, which is so difficult for us to copy, ils more than any other colour in flowers. here are some curious facts, which appear than mere coincidences, which I have ed in connection with this subject, and appear to point out to us that we are not ry far from the disideratum of coloured graphs even in our present processes. am not prepared to enter further into this r at present, but will just mention one in- e. We all know that blue in our present sses acts the same as white; now if we turn ure, we find that flowers of blue or purple , are extremely liable to change into white. ifferent species of campanula, the harebell, iolet, &c., have all their white varieties. , in drying blue flowers for the herbarium uite impossible, in many cases, to preserve lour, the flowers become white in a little however carefully they may have been ved. A series of careful observations might o some practicable result, and any one ad the time to devote to the subject would, sure, be amply rewarded, even though he to discover the process of obtaining pho- hs in their natural colours."

SIDEBOTHAM exhibited a landscape taken in 1852, in which a green tint on the and a reddish tinge on the buildings were observable.

Rev. CHAIRMAN said a curious instance of ad come under his own notice, in which ins in the hands of a portrait were strongly d with colour.

as stated that Professor Frankland, in uence of other engagements, had not been prepare the expected paper on photogra- rinting.

CHAIRMAN pointed out a neat mode of ex- g photographic transparencies in the form ade for the moderator lamp.

e conversation ensued, in which opinions xpressed in favour of employing fused of silver for the sensitizing bath in the -albumen process.

MANN said that he had had very good from the oxymel process of Mr. M. Lyte, r. Sidebotham bore testimony to the of some of Mr. Mann's pictures.

COTTAM (hon. sec.) said he had been in- to bring a picture of his, though a bad account of a singular circumstance. He cured from Mr. Dancer a number of pre- plates (collodio-albumen), and exposed n developement there appeared a picture e had not expected: in addition to the o which he exposed the plates, there d the traces of an experimental picture y Mr. Dancer, namely, a scene in his with a staff with figures on a card at . On investigation it turned out that the plate was one which Mr. Dancer had tried whilst investigating Mr. Sutton's views on the distance of the lenses in the stereoscope, in August or September last. The plate had lain aside after exposure without development, and was not even resensitized before it was acci- dentally given to Mr. Cottam, with others, and then exposed by him when both Mr. Dancer's picture of August, and Mr. Cottam's of March, came to light; the first picture having been latent since August.

Mr. EDWIN OFFER was appointed auditor of the Society's accounts for the past two years.

The members present received their copies of the Society's Photographic Illustrations, the Secretary stating that the remainder would be issued in a few days.

This meeting closes the Society's session, the next announced meeting being the annual one, 5th of August next.

The Council, however, hope to hold one or two meetings of members in the interim.

LONDON PHOTOGRAPHIC SOCIETY.

THIS Society held its ordinary monthly meeting on Thursday last, the 2nd instant, Sir W. J. NEWTON, Vice-President, in the chair.

After the formal business of the meeting, the chairman introduced Mr. WILLIAM CROOKES to the members, as the Secretary of the Society and Editor of its Journal, in place of Mr. Major, who had resigned.

The SECRETARY made a few remarks, acknow- ledging the kindness with which he had been welcomed to the office by the members, and briefly recapitulated some of the reasons which had induced him to become a candidate.

Sir W. NEWTON then proceeded to give an account of his improved method of negative printing, exhibiting at the same time the manipulation of preparing the paper and de- veloping the picture, exposed sheets having for this purpose been brought to the meeting.

Mr. ACKLAND then exhibited and explained his improved portable stereoscopic camera and box. In this arrangement were packed in a very small compass the camera, lens, focussing glass, spirit-level, view-meter, and twelve backs for sensitive plates, the whole fastening into a box which admitted of being screwed on the top of the camera stand, and having on the upper part a groove in which the camera could slide laterally about four inches, so as to produce stereoscopic pictures with one lens.

A discussion ensued between Mr. Malone and Mr. Ackland as to whether the parallelism of the two positions of the camera in the above arrangement would not produce distortion of the resultant stereoscopic image; the former gentleman arguing that Mr. Latimer Clark's arrangement would give a truer perspective.

An animated discussion then took place res- pecting the proper distance apart for the two points of sight in taking stereoscopic pictures; nothing of importance being elicited, it was suggested by Mr. Shadbolt that the subject was one of such importance that it would well repay the society for devoting an entire evening to it, and finally it was agreed that the next meeting, on May 7th, should be devoted to a consideration of this subject.

The SECRETARY then read a paper by Mr. SANG, on a *New Preservative Process*, of which the following is an abstract:—

The author proposes the employment of a light coloured molasses, called in the shops *golden syrup*, as a preservative agent for collodion plates; and the following method of using it is stated by him to be easy in manipulation, of great certainty, and little inferior to that of M. Taupenot in its results. The collodion contains equal parts of alcohol and ether, and to each ounce are added four grains of iodide of calcium, and a ½ grain of bromide of calcium; the silver bath is as usual, and after removing from this, the plate is to be well washed with distilled water. A solution of

Pyrogallic acid....................	1 grain
Tartaric acid	⅜ „
Water	1 ounce

Is next to be poured over it, and when well absorbed by the film, poured off; then a mixture of equal volumes of golden syrup and water is to be poured on and off in like mannér, and after allowing the plates to drain for about 15 minutes, they may be put away for use: the exposure is about double that of moist collodion. The developer is to be conducted in the ordinary way, having previously washed off the syrup with distilled water: the picture is to be finally fixed with cyanide of potassium.

A detailed account of experiments made before arriving at the best method of manipulating was then given, and the causes of several imperfections, such as spots of various kinds on the plates, which occurred in his earlier experiments, were pointed out and remedies stated: they were all due to imperfect manipulation, and may be obviated by taking greater care.

Mr. MALONE stated that he had found that by heating cane sugar to about 250 Fah. it became fluid, and lost its power of crystallizing; it was very deliquescent, and would doubtless be found to possess great advantages, in preserving collodion plates sensitive, over honey or golden syrup, as the latter could never be relied on for uniformity and were often mixtures of very impure materials.

The SECRETARY then read a letter from Mr. Maxwell Lyte, mentioning some improvements which he had made in his phosphate of silver printing process.* He concludes by saying—"This process is so successful that I now never employ any other, and find that with it I can print and finish at least twice as many proofs in the day as with the old process; it is more rapid, gives (many think) finer tones, and requires no over-printing; offers extreme facilities for collecting the waste silver, of which enormous quantities were lost by the old method; and, best of all, *avoids entirely the use of hypo in any shape or form.*"

After a few observations from Mr. Shadbolt and Mr. Malone, the meeting adjourned.

NEW METHOD OF OBTAINING POSITIVES.

By M. A. MOITESSIER.

M. MOITESSIER employs the camera for copying a negative in the same way as if he were reproducing an engraving: whilst an ordinary engraving will give a negative, this, treate[d in] the same manner, should yield a positive im[age,] and in the same way that an engra[ving] can be copied of any size by varying [the] distance between it and the lens, so may positives of any size be obtained from [a] negative. For this purpose it is sufficient, having obtained the focus and taken the [cus]tomary precautions, to place in the instru[ment] a collodion plate, and thus obtain a pos[itive] which can be developed as usual. The i[mage] thus obtained, as will easily be imag[ined,] possesses all the qualities of the negative, [being] taken by the same means—all the sharp[ness,] softness, and transparency in the shadows, [which] give such a charm to a good print, being pre[served.]

There only remains now to remove the [collo]dion film from the glass on to a sheet of [white] paper. Enamelled card, such as is use[d for] visiting cards, is the best for this purpose, [being] perfectly uniform, free from granular appea[rance] on the surface, and possessing a lustre [which] gives a very agreeable tone to the pi[cture.] The operation of removing the film, seem[ing] so delicate, is nevertheless very simple, a little practice being sufficient to ensure [suc]cessful results.

M. Moitessier arranges his camera and [nega]tive in the following manner:—an apertu[re the] size of the negative is cut in a window sh[utter,] having grooves down the sides to hol[d the] negative (which will thus be inside the r[oom).] On the outside of the shutter are similar gr[ooves] to hold a piece of ground glass, for the pu[rpose] of removing the transparency of the neg[ative,] and thus prevent objects beyond it being c[opied.] No light should enter the room but what [passes] through the picture, as on this depends [in a] great measure, the brilliancy of the po[sitive] obtained. It is better to have a window ex[posed] to the sun, as the operation is then consid[erably] quickened; but this is by no means [indis]pensable, as pictures can be copied easily [in the] shade or in dull light, when nothing could [have] been done by the ordinary process. In fr[ont of] the negative is placed an ordinary camer[a and] lens, exactly in the same way as in copy[ing an] engraving: either single or compound [achro]matic lenses may be used indiscriminately.

For positives not larger in size than [a quarter] plate, M. Moitessier uses a very simple app[aratus] which enables him to take four copies [at the] same time instead of only one. By m[eans of] this apparatus, from twenty to five and t[wenty] positives can easily be taken, and finally m[ounted,] in an hour, which far surpasses most [of the] methods now in use. His apparatus con[sists of] four small lenses of 1 inch diameter, [and ...] inches focus, each mounted on a small sl[ide; in] the front of the camera are four pairs of di[stinct] grooves to receive the four slides whic[h carry] the lenses.

It will be easily understood that with [this] system there ought to be seen on the [ground] glass four images of the same object, ea[ch per]fectly sharp, provided that the lens[es are] identical in their focal lengths. It [is also] evident that the system can only be u[sed for] reductions and not for enlarging, and th[at the] image should never be larger than a qua[rter or] a third of the size of the negative: unde[r these]

*We intend shortly to give this excellent process in full to our readers.—Ed. L. & M. P. J.

litions there is no sensible distortion. If it esired to obtain very small pictures, for ınce, to serve for illustrating visiting cards, een copies can be taken at one time by ns of this apparatus: thus, supposing an raving be desired, a negative is first taken ı it by means of the four object glasses, and four images are obtained on the same e, and this negative treated in a similar ner yields in the apparatus sixteen positives ne operation; the method is, however, only icable to obtaining very small pictures.

he interior of the camera must be divided four compartments by a vertical and hori- al partition, so that the action of each lens be kept to the proper part of the plate. is a very important arrangement, for rwise the different images would overlap produce confused pictures: the interior ıces must be painted black. M. Moitessier loys collodion as the sensitive material on h the positives are taken, and the manner sing it differs but little from the negative ess. The preparation of the glass is exactly same in each case, but one important point t be attended to in the collodion—that h is employed ordinarily for the production egatives gives excellent results, but it is what too fluid to allow of the positives being ved from the glass; an increase, however, ie amount of gun-cotton present at once dies it. The nature of the iodide employed little consequence, as the sensitiveness is condition of success; however, as iodide nc gives a very uniform collodion it is er preferable.

ie glass plate having been coated with dion in the ordinary way, is rendered itive in a silver bath of 15 grains to the e, and then exposed in the camera. The tion of exposure is very important, but as ıy vary between a few seconds and fifteen ıtes, it cannot be indicated precisely. The ısity of the light, more or less transparency e negatives, focal length of the lens, size of diaphragms, sensitiveness of the collodion, are all causes which materially influence apidity of action. In general, for a collo- negative of ordinary intensity, working sunlight with a lens of 12 inches focus and inch aperture, to obtain positives of the size, the exposure in the camera should tween one and two minutes: for magnifying ill take longer, and for reductions shorter ; paper negatives, in general, require a ı longer exposure, sometimes upwards of a ter of an hour.

may be seen, practice is the only guide; experiment, moreover, giving more valuable ations than could possibly be described here. quadruple object glass apparatus is very ıl in determining accurately the proper of exposure, as, by giving each image a rent time, this difficulty will be solved in experiment. The image is developed by ıs of pyrogallic acid as usual for negatives, the exception of being rather weaker. Ioitessier prefers the following:—

Pyrogallic acid	1 grain.
Glacial acetic acid	10 ,,
Water	$1\frac{1}{4}$ ozs.

This liquid should be spread uniformly, and at one motion, over the surface of the glass, as in developing a negative; the image should appear at once, and very quickly darken to its full intensity; if it is at all sluggish in appearing, it is a sure sign of the exposure being wrong, and the result will be hard and wanting in half tone. On the other hand there must not be the opposite fault, which is seen by the action being too energetic, as then the picture will be flat: on an average a minute should suffice for the development.

After developing, the picture must be carefully washed and fixed in the ordinary manner. The following solution of hyposulphite of soda may be employed:—

Hyposulphite of soda	65 grains.
Water	1 ounce.

But M. Moitessier prefers cyanide of potassium, which appears to give more agreeable tones. It should be very weak, as otherwise, owing to its energetic action, there will be danger of its attacking the picture. The following is a very safe strength:—

Cyanide of potassium	4 grains.
Water	1 ounce.

This solution is to be poured on the plate and back again once or twice, if necessary. Its action will be finished when all the parts which have been unacted on by light have been dissolved away, and have left the picture perfectly transparent; it should then be washed plentifully, to remove the excess of cyanide. If it is desired to obtain glass stereoscopic transparencies, it will only be necessary now to dry the plate, as the picture, by transmitted light, is of a very agreeable colour, which it is not necessary to alter. But the case is different if the picture is to be transferred to paper; some operations must follow the fixing, so as to alter the colour, which would otherwise be very unpleasant.

After the picture has been fixed and carefully washed, a saturated solution of bichloride of mercury must be poured over it. The first effect of this solution is to slightly darken the image, but it soon becomes white, and a perfect negative, if viewed by reflected light. The action is complete when the image is of a uniform dead white, which takes about one or two minutes to effect; when this is the case, it is to be copiously washed, and the following weak solution of hyposulphite of soda poured over it—

Hyposulphite of soda	30 grains.
Water	1 ounce.

Under the influence of this solution the image immediately changes colour, and assumes an agreeable velvet-black tone. Sepia tints are obtained by a longer exposure in the camera, and the employment of a weaker solution of pyrogallic acid for developing.

It is of importance in the uniform action of the hyposulphite, that the plate should be well freed from bichloride by washing, and that it be thoroughly drained. Without this precaution, the large amount of water on the surface prevents the regular spreading of the hyposulphite; it will be thus of different strengths in different parts of the plate, and give rise to stains which nothing will remove. After this there only remains to well wash the picture, and it will be ready for removing on to paper.

These operations may seem tedious and difficult, but M. Moitessier assures us that what appears complicated in description is very simply and rapidly executed in practice. Even to those who are not very *au fait* in photographic manipulation, there will not appear any serious difficulty, and a very few trials are sufficient to enable the operator, even when unexperienced, to obtain satisfactory results.

The remaining operation of removing the collodion film presents no difficulty, provided the collodion is tolerably thick. The selection of a good white surface, on to which the transfer is to be made, is of the greatest importance, and after many fruitless trials, M. Moitessier hit upon glazed enamel card, which is admirably adapted for this purpose; it is very smooth, the collodion adheres perfectly without the aid of any cement, and dries without any danger.

The transfer is effected thus:—the card must previously have been cut into sheets a little smaller than the glass on which the picture is, and then is to be immersed into a basin of water for a few seconds. The glass having then been placed on a levelling stand, is next to have as much water as it will hold poured over the surface. The sheet of wet card is next to be laid down on it, taking care to have no air bubbles imprisoned, and the glass must then be gently lifted up, holding the card by the two corners to prevent its slipping, and held vertically for a few minutes to allow the liquid to drain off; that being done, the collodion film must be detached from the glass, and folded over the card. If now the collodion film and card be gently removed by one of its edges, the film will be sure to detach itself, without the least difficulty, from the glass on which it had previously been supported; and after drying, either in the sun or by a gentle heat, will be finished. The entire process presents no difficulty, and always succeeds, provided the collodion be of the proper consistency.—*(Science pour tous.)*

ROYAL INSTITUTION OF GREAT BRITAIN.

At the weekly meeting of this Institution, held on Friday evening, February 13th, 1857, Sir Benjamin Collins Brodie, Bart., D.C.L., F.R.S., in the chair, Mr. Thomas A. Malone, F.C.S., Director of the Laboratory in the London Institution, delivered the following lecture, "*On the Application of Light and Electricity to the production of Engravings—Photogalvanography.*"

"The subject of this discourse is one with which the speaker has been for some years practically acquainted. In 1844, he experimented for many months upon the engraving process of M. Fizeau. Since that time he has closely watched all the steps of improvement that have been taken, down to the latest investigations of Talbot, Niepce de St. Victor, Pretsch, and Poitevin. He ventured thus to think himself fairly entitled to lay before the auditory the numerous remarkable and beautiful specimens he had gathered, or kindly been furnished with, accompanied by such commentaries and notices of processes as the time admitted.

"The various methods hitherto devised for the accomplishment of that important problem, the certain perpetuation and cheap multiplication—by means of printer's ink and the ordina printing presses—of the images of natur objects, as obtained in the camera obscura l the processes of ordinary photography, may arranged under three great divisions.

"The *first* method, in which light was used aid the engraver's art, was almost coeval wi the first attempts made to produce sun-dra pictures. Indeed it has been asserted that ph tography and photographic engraving were i vented between the years 1813 and 1827, l one man, Nicéphore Niepce, of Chalon on t Saône. A reference, however, to the Journal the Royal Institution* would show that phot graphy really sprang from the labours of Thom Wedgwood and Humphry Davy, as far back the year 1802.

"Although we cannot accord to Nicéphe Niepce the merit of originating photograp we must give him the undivided title of foun of the art of photographic engraving; and, mo over, acknowledge that he was the first to not only a *direct positive* photograph, but also secure on metal and glass plates the images the camera, and this long before Daguerre p duced his wonderful plates. Of this there c remain no doubt, after a study of the remarka specimens which Dr. Robert Brown has kindly enabled photographers now for the fi time publicly to examine. It was not genera known that Niepce's images of 1827 had much that is beautiful, in common with t daguerreotype of a later date. Daguerr pictures may be said to be only exalted amples of the same phenomenon; yet the p cesses are widely different. Niepce's metl was beautifully simple, and as it gives us ground-work of his etching process, must briefly described. He took a bituminous s stance called jew's pitch, or asphaltum; u this he poured oil of lavender to resolve bitumen into a varnish with which he c coat plates of metal or glass. He used chi pewter and copper plated with silver. A p coated and dried was exposed to the light w an engraving superimposed, or it was place the field of the camera obscura, just as We wood and Davy placed their prepared pap and with a certain similarity of result, inasm as a photographic image was obtained on varnished plate. This image, however, un that of Wedgwood and Davy, was *not vis* The plate had to be submitted to the solv action of a mixed liquid, composed of one of oil of lavender and ten parts by measur *white oil of petroleum*, or mineral naptha. immersion in this fluid the remarkable fac vealed itself, that wherever the light had the varnish had become insoluble, and certain degree proportionately so to the in sity of the light. There were not only li and shadows but half tints. The picture soon as developed by the solvent, was remo drained, and washed with water to check further action. The shadows of the pic were now represented by the parts of the w metal, or glass plate laid bare; the lights given by the film of varnish which the l had hardened, and the solvent had left touched. The plate now finished was cap

* Journal of the Royal Institution, vol. 1, p. 170.

of being etched by simply pouring engraver's acid upon its surface. The varnish would protect the metal from the acid over the lights of the picture; while the shadows, represented by the bare metal, would be bitten in the manner common to all etching processes. On now removing the protecting varnish, the plate could be inked and printed from by the common copper-plate printing press. Such are the essential details of the first of the photographic engraving processes. The specimens on the table were presented in 1827 to Mr. Bauer, late of Kew, by Nicéphore Niepce, who for a short time resided at Kew, on a visit to a brother in infirm health. Niepce prepared a statement regarding his invention, for presentation to the Royal Society; but as he at that time kept his process secret, his manuscript was not published. Niepce appears to have returned to France, disappointed at his ill-fortune.

"Niepce's bitumen process was improved by his nephew, M. Niepce de St. Victor, who has published a treatise* on it, giving the necessary minute instructions. The main features do not differ from those above given, though greater sensitiveness and perfection have been obtained. MM. Mante, Belloc, and Nègre, MM. Barreswil Davanne, Lerebours, and Lemerciere have also advanced the bitumen process: the latter gentleman having applied it to lithographic purposes. The process is still under trial; but the difficulties of obtaining a constantly uniform result at present stands in the way of its general adoption. It still deserves a thorough investigation.

"The *second* method of producing photographic engravings is founded upon certain properties possessed by the daguerrean image. It is found that a daguerreotype unfixed by gold is acted upon by nitric acid in its shadows, while the lights long resist the biting action of the acid. This is explained by assuming that the shadows are of pure silver, and that the lights consist of mercury—the acid attacking the silver by preference. The fact is, that an etching is obtained by merely leaving diluted nitric acid in contact with the plate. The etched plate is then inked and printed from, as in Niepce's case. Dr. Donné, of Paris, appears to have been the first to devise this method. Dr. Berres, of Vienna, also used nitric acid for this purpose; but the action is not easily controlled, and this form of the process is fallen into disuse. In 1842, Mr. Grove published in the Philosophical Magazine, a method by which Daguerre's images can be engraved by the chlorine evolved by voltaic action, when the daguerreotype plate is made the positive terminal of the battery, and immersed in diluted hydrochloric acid; the negative wire being terminated by a plate of platinum, which was placed opposite and parallel to the photographic image. This process is much more under controul than the last. [Prints from plates so engraved in 1842 were on the table.] This process is also worthy of further investigation. Here the image is truly drawn by light and *engraved by electricity*.

"M. Fizeau, about the year 1844, also patented in this country, in conjunction with M. Claudet, a process for engraving the daguerreotype image. The speaker was instructed in this process by M. Fizeau, and worked for many months at its perfection. Results obtained both in France and England were upon the table, and showed that in cases where great delicacy of delineation was required, as in certain anatomical subjects, this process had not been surpassed. It quite justified the formation of a second division of the available photographic engraving processes.

"M. Fizeau, like Mr. Grove, availed himself of the affinity of chlorine for silver, but relied on chemical action for its application. He (M. Fizeau) made a solution of common salt and nitrite of potash in water, to which he added nitric acid. This mixed acid acted immediately, when aided by warmth, upon the silver of Daguerre's plate, and left untouched the parts supposed to be completely covered by mercury. Chloride of silver was thus at once formed in the shadows of the images, and after some time in the half tints also. A very faint etching was thus produced. A prolonged application of the acid would not further deepen the etching, since the insoluble chloride of silver at first formed protected the faintly etched parts from a further deepening corrosion. It was therefore necessary to remove the chloride of silver by washing with a solution of ammonia. This effected, the plate was ready for a second application of the acid, when chloride of silver would be again formed, to be once more removed by ammonia; and this alternation of solutions could be repeated a certain number of times, the etching increasing in depth at each operation. But in practice it was found that after a few applications of the acid, the lights of the image also gave way, and thus the engraving came to an untimely end. To remedy this circumstance was M. Fizeau's great aim; and he succeeded in a marked degree by heating the etched plate in a strong and boiling solution of caustic potash, after which treatment the lights resisted well the injurious action they had before suffered from. It is not clear how the potash acts. M. Fizeau has supposed, and the speaker was inclined to support the view, that the potash acts merely as a hot bath, possessing a proper and regular temperature, which might restore the continuity of the amalgamated surface of mercury and silver, as often as it was weakened to the point of breaking by the *under-biting* of the acid liquid. The heating in potash is an important feature in M. Fizeau's process. As soon as the etching has been carried as far as possible by the acid mixture, the plate is dried and inked with fine printer's ink, and an impression may be immediately taken; but M. Fizeau prefers that the ink should be allowed to dry in the hollows of the plate, the unetched parts being wiped clean, so that gold may be deposited only upon the bright parts by the electrotype process. On now removing the ink, ordinary diluted nitric acid may be safely applied to the plate, to deepen still more the shadows, without any danger of destroying the lights of the picture. This last step causes M. Fizeau's etchings to possess greater vigour than those obtained by Donné's or Grove's processes. The danger is, that under-biting may remove the half tints.

* Traité Partique de Gravure Héliographique, par M. Niepce Saint Victor, Paris, June, 1856.

However, some beautiful results obtained by the late Mr. Hurliman, a skilful engraver in Paris, attests the worth of this method. M. Fizeau, foreseeing that the wear and tear of the silver plates might be considerable, thought to use the electrotype process to produce fac-similies of the engraved plates, reserving the original plate unworn to supply any further demands, thus allowing any number of impressions to be struck off. Plates so electrotyped by the speaker twelve years ago, some of which were afterwards worked upon by an engraver, were placed upon the table. The patent-right in this process will soon expire.

"The processes of the *third* and last division were, it must be confessed, very desirable; notwithstanding the numerous satisfactory specimens obtained, and still to be obtained, by the processes previously described. The truth seemed to be that none of the processes gave uniformly satisfactory results: hence the necessity of being acquainted with the capabilities of all the chief known methods, and of impartially comparing them, with a view to produce any special required result.

"Mr. Henry Fox Talbot opens the third division by his method known as the gelatine and bichromate of potash process, in which a steel plate is covered with a liquified jelly, containing bichromate of potash in solution. This jelly was allowed to dry upon the plate after the manner of Niepce's varnish; and the gelatined plate might be used in a similar way to reproduce engravings or the images of the camera; the light, as in Niepce's case, doing its work by altering and hardening the gelatine whenever it fell with sufficient intensity. On removing the plate from the light, and immersing it in water, it was found that the gelatine had become comparatively insoluble where the light had acted, but it retained its usual solubility over those parts which were in shadow. Thus the metal could be partially laid bare, as we have seen was the case in the bitumen process; the lights now would consist of the altered gelatine, and the shades be represented by the bare metal; it is evident we have only to pour an acid upon the plate to obtain an etching: but here some care and ingenuity will be required. Nitric acid acts so energetically and so uncertainly on the steel plate, that but little success would attend its employment. Accordingly, Mr. Talbot was led to seek a better engraving liquid. This was found in a solution of bichloride of platinum, which appeared to act in the desired manner. The advantage of any process on steel plates would be obvious, from the great number of impressions that so hard a body would yield under the wearing action of the printing press. It might here be observed that the bitumen process had also been applied to steel plates by M. Mante, in a series of natural history plates, published in Paris; and also by M. Niepce de St. Victor, in the frontispiece to his treatise.

"In 1854, Herr Paul Pretsch, of the Imperial printing office of Vienna, patented in this country, and subsequently in France, a process which he has called *Photogalvanography.* He used Mr. Talbot's materials, but with certain additions, and avails himself of a property of the gelatine which allows of his dispensing with the acid etching altogether. We are unable to speak with certainty of the exact comparative merits and capabilities of the two processes. Mr. Talbot's results are on steel; Herr Pretsch's on copper. If other things be equal, the steel would possess the advantage of greater durability. Herr Pretsch takes one part of clear gelatine or glue, and about ten parts of water to form a jelly, which he mixes with a strong solution of bichromate of potash; to this mixture he adds a fresh portion of jelly, containing nitrate of silver in solution; the whole being warmed and thoroughly mixed for about ten minutes. He next adds a third portion of jelly, containing a comparatively small quantity of iodide of potassium; then the whole mixture is strained, and is ready to coat the glass plates which are at first used in this process. A plate being coated and dried is applicable to all the purposes enumerated in the early bitumen process. It can be used to copy engravings by superposition, or be made to receive the images of the camera. However, it is found that the most practical way to make use of the bitumen and gelatine processes, is to copy from a positive photograph which has resulted from a collodion or a Talbotype negative. We have only to place the positive print upon the dried orange-coloured jelly, press it in contact by a plate of glass, and expose the whole to the light for some time, when we shall find upon removal that we have obtained upon the dried jelly a photographic representation of the positive print. Wherever the light has acted strongly the plate will have changed from its bright orange-red colour to a more tawny hue; this latter shade of colour gradually passing in the half tints into the unaltered red of the parts completely shielded from the light. The parts acted upon by the light have now become, as in Mr. Talbot's case, comparatively insoluble in water. So far, Herr Pretsch's process has much in common with Mr. Talbot's, but the two experimenters now *diverge* widely. Herr Pretsch, instead of dissolving away the unaltered jelly, merely soaks the plate in water long enough to cause the unaltered gelatine to swell, and so to rise above the surface in such a way that we obtain a picture in relief resembling the condition of an ordinary cut wood-block. The tawny coloured parts do not swell, and so they remain depressed, representing the sunken portions of the wood-block. If the swelled gelatine were hard enough, we might at once ink the raised parts by a roller, and print in the usual way. This, however, is impracticable; and, moreover, surface printing is not in this art deemed to be the best mode of procedure. A device, analagous to one used in type printing, is therefore adopted; a sort of stereotype process is gone through. A mould, in softened gutta percha, or other suitable moulding material,—possibly a composition of wax or stearine, is made; this mould will of course have the raised lines or dots of the original gelatine represented by grooves and cavities apparently graven in the surface; and here, again, if the mould were firm enough, we might ink it as if it were an engraved copperplate, and print by the copper-plate printing press. From these considerations it will be

evident that we have only to seek to convert these yielding surfaces into enduring ones, and we shall end our labours successfully. This the electrotype art enables us to do. We have simply to render the mould a conductor of electricity, by black lead, or finely divided metal, and we can deposit in it copper to any amount. We shall thus get in copper a fac-simile of the original swelled gelatine plate. But since this requires surface printing, and that is not to be preferred, we must once more apply our electrotyping process, using this first obtained and raised copper-plate as a *matrix*, to produce as many engraved or sunken plates, ready to be printed from, as we may desire. The original matrix remains, as in Fizeau's case, unworn.

"The above is an outline of the more important features of Herr Pretsch's invention. There is one more point that deserves attention. In all the engraving processes hitherto described, there is a difficulty in obtaining a granular surface over the etched parts, necessary to hold the amount of ink required by the printer. In Pretsch's process this difficulty remarkably enough does not present itself; the swelled surface breaks up in a direction vertical to its surface into little masses which are just what is desired: this result is quite characteristic; it has been attributed to the presence of particles of chromate of silver, or of iodide of silver. Would it be too far-fetched to suppose that it is another beautiful instance of the slaty cleavage action demonstrated by Dr. Tyndall? However this may be, the fact is very important for the success of the invention. The chemistry of the processes of the first and third divisions of this subject is but little advanced. M. Niepce de St. Victor has found, what M. Chevreul had anticipated, that the oxygen of the atmosphere is essential in the bitumen process. In an illuminated vacuum the result could not be obtained, although ordinary photographic action went on quite as well as in air. With reference to the gelatine processes, it might be observed that Mr. Ponton, who first used bichromate of potash as a photographic agent, and M. Edmond Becquerel, who extended its use on paper, both found that the sizing materials became more insoluble by the photographic action. It was believed that chromic acid was liberated by the sun's rays, since simple mono-chromate of potash produced no effect. On mentioning these facts to a friend (Dr. Hugo Muller), the speaker learned that solutions of chromium had been employed in Germany in experiments on tanning skins; and it therefore suggested itself that the chromic acid set free might, in reacting on part of the gelatine, liberate an oxide of chromium, which, when combined with the rest of the gelatine, would form a species of artificial leather; thus rationally accounting for the comparative insolubility of the altered and tawny coloured portions of the jelly. The subject, however, requires and deserves a more thorough investigation.

"M. Poitevin, of Paris, has applied the gelatine and bichromate of potash process to lithographic stone, and his results, placed on the table, would well bear a comparison with those obtained by the other methods described in this division.

"The speaker, in conclusion, expressed his opinion that these engraving processes would greatly advance the art of photography itself, particularly in its applications to the delineation of coloured objects, in which it is still very imperfect, although some progress has been made."

INVENTION OF PHOTOGRAPHY.

[Extracted from the Journal of the Society of Arts.]

In a French work, lately published,* in which a review is given of the results of photography, as shown in the Paris Exhibition of 1855, after awarding great praise to the works of Mons. Bayard there displayed, the author proceeds as follows:—

"Mons. Bayard is one of the inventors of photography on paper. When this discovery existed only in the limbo of science, that is, before the publications of Fox Talbot, he, by himself, had already discovered, in his own secluded retreat, the method of fixing on paper the images of the camera obscura. The fact, at the present time, is almost unknown. For this reason, if the reader will permit me to digress, I will relate how Mons. Bayard came to discover the art of photography on paper, and how his discovery has remained a secret from all. The tale, besides, is not long; in fact, as we should say, it is only the history of a peach. Mons. Bayard is the son of a respectable local judge, who exercised his duties in a small provincial town. He occupied his leisure hours in cultivating his garden. In this garden was an orchard, whose splendid peaches ripened under the autumn sun. Mons. Bayard, the father, was in the habit every year of sending to his friends baskets of this fine fruit, and, with the natural pride of a proprietor, he took pains, when he sent them out, to mark by some unmistakeable sign that the fruits were the produce of his garden. He conceived a singular mode of effecting his object, which, unknown to the inventor, was a real photographic process. He picked out a peach on the tree in the process of ripening; it was, as you may imagine, one of the best—one of those '*pêches à trente sous*,' which, in after times, thanks to Mons. Alexander Dumas the younger, have played so conspicuous a part in the world—or rather, the dramatic world. In order to preserve it from the action of the sun's rays, our judge took care to cover his peach with leaves. When the peach thus defended from the sun's rays had acquired the desired size, he pulled off the leafy covering, and left the fruit freely exposed to the influence of the light, save that he gummed on the surface of it the two initial letters of his name neatly cut in paper characters. At the end of a few days, when the protecting papers were removed, the two initials were found distinctly marked in white on the red ground of the fruit, which thus became impressed with an unquestionable stamp at no greater cost than the sun's rays. This occurrence, which young Bayard each year was in the habit of witnessing, naturally made an impression on his mind. As a child, he amused himself by repeating this effect of the sun on

* 'Les Applications Nouvelles de la Science à l'Industrie et aux Arts en 1855.' Par Louis Figuier, Docteur ès Sciences, Docteur en Médecine, agrégé de Chimie à l'Ecole de Pharmacie de Paris, &c. Paris: Victor Masson. Place de la Ecole de Médicine, 17; Langloit et Leclerq, Rue des Mathurins St, Jacques, 10. 1856.

pieces of pink paper braided into the form of a cross. The parts of the paper concealed from the light by the overlying bands preserved their colour, while the other parts were quickly bleached. Afterwards, having tried, like many others, to fix the images of the camera obscura, Mons. Bayard conceived the idea of using for the purpose the rose-coloured paper which had served to divert his infancy. But placed in the camera, the paper was not sufficiently sensitive to the light. Mons. Bayard then resorted to the use of chloride of silver in lieu of this inactive paper—the very photographic agent in use at the present time. He thus succeeded in obtaining actual photographic impressions on paper, with this remarkable circumstance, that the images were direct, that is, without the necessity for the use of a previous negative. In the picture obtained, the lights corresponded to the lights of the object, the blacks to the shadows. His process consisted in exposing paper impregnated with chloride of silver to the action of the light, but only up to a certain point, which experience had taught him. When he wished to use it for obtaining a photographic image, he soaked this paper in a solution of iodide of potassium, and exposed it to the action of the light in the camera obscura. The rays of light had the effect of blanching, or rather of giving a very light yellow tint to the silver salt in those parts on which the light shone. There remained only to fix the images by means of hyposulphite of soda. Such is the process of photography on paper which Mons. Bayard invented, and which he, for the sake of his reputation, was to blame in desiring to keep secret. It was then that those beautiful impressions were obtained which Mons. Depretz showed us, fifteen years ago, at his lectures on Physics, at the Sorbonne, and which he passed from hand to hand without being able to guess by what magic such marvels had been produced. How could it be guessed that such splendid effects had their origin simply from observing the actions of the sun's rays on a peach, and that the delicious gift of the Persian of old had exercised so great an influence on the progress of modern physical science. These very pictures, which so charmed us at the Sorbonne, I think I had the pleasure of recognizing in the case sent by Mons. Bayard to the Exhibition. Of course, it is understood that Mons. Bayard no longer obtains his pictures by his old method. He now practices, like almost everybody else, photography on glass, but he has carried it to great perfection.

SOME CONDITIONS WHICH INFLUENCE THE DEVELOPMENT OF THE LATENT IMAGE IN THE COLLODION PROCESS.

By F. Hardwich, Esq.

Accelerating effect of certain organic matters.—Organic bodies, like albumen, gelatine, glycyrrhizine, &c., which combine chemically with oxide of silver, and have the effect of lessening the sensitiveness of the film to light, facilitate the development of the image, so that, on the application of the reducing agent, a dense deposit is formed, of a brown or black colour, by transmitted light.

In the same way, viz. by a retention of organic matter, may in all probability be explained the fact, that the collodion image developed by pyrogallic acid, although proved by the application of tests to contain an equal quantity of silver, possesses greater opacity by transmitted light, than that resulting from the use of protosalts of iron; and so with regard to the collodion itself, if it be pure and recently prepared, it is liable to give a less vigorous impression than when, by long keeping, a partial decomposition has taken place, and products have been formed which combine with reduced oxide of silver more easily than the unaltered pyroxyline.

Molecular conditions affecting Intensity.—The physical structure of the collodion film is thought to exert an influence upon the mode in which the reduced silver is thrown down during the development. A short and almost powdery state, such as collodion iodized with the alkaline compounds acquires by keeping, is considered favourable, and a contrary structure unfavourable to density. This is certainly the case when the film is allowed to dry before development, as in the process with desiccated collodion, and, to some extent, in the oxymel preservative process.

A development conducted rapidly tends also to produce an image of which the particles are finely divided, and offer a considerable resistance to the passage of light; whilst a slow and prolonged development often leaves a metallic and almost crystalline deposit, comparatively translucent and feeble.

With certain samples of collodion, it will be observed, the image is much enfeebled by keeping the plate for a quarter of an hour or longer after sensitizing, but before development. This effect is not due to the nitrate of silver having partially drained away from the plate, inasmuch as the plan which has been proposed of re-dipping in the nitrate bath immediately before applying the pyrogallic acid, does not prove a remedy. An alteration of molecular structure may perhaps, therefore, be the correct explanation, and if so, a contractile collodion would suffer more than one possessing less coherency.

The actinic power of the light at the time of taking the picture influences the appearance of the developed image; the most vigorous impressions being produced by a strong light acting for a short time. On a dull dark day, or in copying badly lighted interiors, the photograph will often lack bloom and richness, and be blue and inky by transmitted light.

Development of images upon Bromide and Chloride of Silver.—Of the three principal salts of silver, the iodide is the most sensitive to light, but the bromide and chloride are under some conditions more easily developed, and give a darker image. In the collodion process the difference is principally seen when organic bodies, like grape sugar, glycyrrhizine, &c., are introduced in order to increase the intensity; a far more decided effect being produced by adding both glycyrrhizine and a portion of bromide or chloride, than by using the glycyrrhizine alone.

The intensity of the image affected by the length of exposure.—If the exposure in the camera be prolonged beyond the proper time, the development is usually feeble, and the picture pale and translucent. The effects produced by over-action

of the light are particularly seen when the nitrate bath contains nitrite of silver, or acetate of silver, the image been frequently in such a case dark by reflected light, and red by transmitted light—more nearly resembling in fact a photographic print, developed on paper prepared with chloride of silver. When collodion plates are coated with honey, without previously removing the free nitrate of silver, a slow reducing action is set up, which may give rise to the characteristic appearance after development above referred to. Other organic matters besides honey will act in the same way.

Certain conditions of the Bath which affect development.—Attention may be called to a peculiar state of the nitrate bath, in which the collodion image develops unusually slowly, and has a dull grey metallic appearance, with an absence of intensity in the parts most acted on by the light. This condition, which occurs only when using a newly-mixed solution, is thought to depend upon the presence of an oxide of nitrogen retained by the nitrate of silver. It is removed partially by neutralizing with the alkali, more perfectly so by adding an excess of alkali followed by acetic acid; but most completely by carefully *fusing* the nitrate of silver before dissolving it.

Commereial nitrate of silver has sometimes a fragrant smell, similar to that produced by pouring strong nitric acid upon alcohol. When such is the case, it contains organic matter, and produces a bath which yields red and misty pictures.

Nitrate of silver which has been sufficiently strongly fused to decompose the salt, and produce a portion of the basic nitrite of silver, exhibits great peculiarity of development, the image coming out instantaneously and with great force. This condition is exactly the reverse of that produced by the presence of acids, in which case the development is slow and gradual.

In summing up the different conditions of the nitrate bath which affect the development of the image, as many as *four* might be mentioned, each of which gives a more rapid reduction than the one which precedes it. These are—the acidified nitrate bath—the neutral bath—the bath of strongly fused nitrate of silver—and a solution containing the *ammoniacal* nitrate of silver, which is quite unmanageable, and produces an instantaneous and universal blackening of the film.

Greater intensity of image is commonly obtained in a nitrate bath which has been a long time in use, than in a newly mixed solution; this may be due to minute quantities of organic matter dissolved out of the collodion film, which have an affinity for oxygen, and partially reduce the nitrate of silver; and partly also to the alcohol and ether which accumulate in an old bath, producing a more short and powdery structure of the film.

The above has been extracted from the fourth edition of "Hardwich's Photographic Chemistry," which is now passing through the press, and will be before the public in a few days. We can confidently recommend it to our readers, as being not merely a reprint of the former edition, but also as containing a vast amount of really useful practical information, deduced from the author's recent researches on the theory of the collodion process.

The following is the introduction to the new edition:—

"The author has endeavoured to keep pace with the improvements which are daily being introduced in the science and art of photography. In the present edition alterations have been made in the style and general arrangement of the work, and additional matter has been inserted.

"Since the publication of the third edition, a series of experiments have been made on the manufacture of collodion, the results of which have thrown further light upon the conditions affecting the sensitiveness of the excited film, and have enabled the writer to introduce an organic substance, "Glycyrrhizine," which will be found of service in making photographic copies of engravings and similar works of art.

"Dr. Norris, of Birmingham, has within the last few months communicated a paper on *dry collodion*, which places the theory of that subject upon a better footing than before. The oxymel preservative process is now also thoroughly understood, and may be considered certain.

"In addition to the above, the 'albuminized collodion' of M. Taupenot, which experience proves to be one of the best dry processes at present known, is included in this edition."

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Being merely an amateur, I have had but little experience in photography, but having once or twice met with the appearances described by your correspondent, Mr. Thompson, I have taken the liberty of writing to you respecting them. I have always attributed the blueness or greenness he describes to insufficient development, in which case the reduced silver is too thin; and as he says that where it occurs the plate presents a transparent appearance, I think there can be no doubt that it is in consequence of the development being retarded by too much acid in the bath or the developer, or too little nitrate in the bath, or too little iron in the delevoper. The same effect would be produced by using the collodion too thin, as the film would then retain too little nitrate solution on the surface. However, as he says the annoyance first made its appearance while manipulating in the same manner as that with which he had formerly obtained good results, I should think that in consequence of colder weather a greater amount of iron was necessary in the developer; or the nitrate bath may have become weaker from constant use; or in consequence of the collodion containing free iodine, nitric acid may have been liberated in the bath. Where the greenness presents itself in spots, they generally occur on that side of the plate on which the developer is poured on, in consequence of the nitrate having been swilled away from those parts by the developer. I think if your correspondent will make any alteration in his formulæ favourable to a greater reduction of metallic silver on the plate, he will find the difficulty he complains of speedily disappear. I should advise him to first try the effect of increasing the quantity of iron in the developer.

With respect to the reticulated appearance complained of by Mr. Corey, do you not think that *too much* alcohol in the collodion would produce the same effect?—I remain, sir, yours respectfully, X.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—I am sorry to see in your valuable Journal so little information on the subject of the calotype process. The various modes of preserving the sensitiveness of collodion appear at present to be engrossing all the attention of photographers, and the paper processes are, I fear, falling into disrepute. However, as I am sure some among your many readers will agree with me that the calotype is *the* process for the tourist, I venture to send you a few notes of my manner of proceeding, and the difficulties I have met with, in the hope that you will think them worthy of insertion in your next number; and that others may be induced to communicate their experience in this department of our fascinating art

The principal advantage of collodion seems to be the greater sharpness of the results; but though calotypes will certainly not bear microscopic examination, I am sure quite sufficient detail can be obtained for any ordinary purpose. Indeed I think the risk of breakage in glass negatives is alone more than sufficient to counterbalance all their advantages.

I always use Turner's paper, considering it far superior to Hollingworth's, or any other I have met with. I iodize with the double iodide of silver and potassium (made as directed by Mr. Sutton, though I consider the strength of no importance), applied with a large camel hair brush. With regard to washing, I think 24 hours, as Mr. Sutton directs, much too long a time, though certainly it is an error on the right side. It appears to be necessary carefully to remove the air bubbles which form on the surface of the paper, otherwise the iodide of potassium, not being completely washed out at these points, decomposes the sensitizing solution when applied, and produces white spots in the negative. Now this cannot easily be done if a number of papers are in the same vessel of water, and it is very inconvenient and troublesome to have every one in a separate dish, so I have adopted the following plan, which I find to answer perfectly:—I take a board large enough for six of my papers (9×7) to lie upon, about 30×15 in., and nail a strip of wood about $\frac{3}{4}$-in. thick round the edges, so as to form a sort of shallow trough. The papers being pinned to this by two corners, I place it slightly inclined under a tap, and allow a stream of water to run over them for a couple of hours or so, removing the bubbles from time to time with a camel hair brush. However, as this method is only applicable where there is an unlimited supply of water at command, an easy and efficacious plan of washing is still a desideratum.

I find, however, that though I take the greatest care in the washing, I cannot entirely prevent the occurrence of white spots in the negative, so I conclude that they must be in part attributable to something in the paper. I shall be glad to hear if calotypists generally have met with this difficulty, and how they surmounted it. I think Hollingworth's paper is less subject to this fault than Turner's, but in all other respects it seems decidedly inferior. Metallic particles in the paper give *black* spots in the negative by reducing the silver in the sensitizing solution. I observe in the London Journal for Feb., a correspondent gives as a remedy for these the addition of iodine and cyanide of potassium to the iodizing solution; and no doubt this will prove efficacious, as the free iodine would convert the metal into an iodide, which, if not soluble in water, would dissolve in the cyanide and be washed away.

I may mention here that unevenness in the coating of iodide of silver does not appear to do any harm.

The sensitizing solution I use is two drops aceto-nitrate (30 grains to the ounce), and two drops saturated solution gallic acid to each drachm of water. I apply it with a Buckle's brush, allow the paper to remain a minute or so, and blot off. All accounts of the calotype I have seen concur in stating that the paper, when excited, will keep *at least* twenty-four hours; and Mr. Griffiths (the correspondent of the London Journal just alluded to), though his sensitizing solution contains five drops aceto-nitrate to the drachm, states that he has used his papers in cold weather seven days after exciting, and two days in the *very hottest* weather! Now, I cannot get my papers to keep over twelve hours, without blackening all over when developed; though, if developed within six or eight hours after sensitizing, the results are perfectly satisfactory. How is this? This is another point on which I should like to hear the experience of other photographers. If the papers could be preserved with certainty for twenty-four hours, it would, in most cases, be all that is required; for, on a tour, the papers could be excited either the night before or on the morning of the day when the views are to be taken, and developed in the evening.

To develope, I pin the paper to a board, as in sensitizing, and with a Buckle's brush apply the mixture of aceto-nitrate (30 grains) and gallic acid solution—equal parts, if the picture is invisible, or nearly so, and proportionably more of the gallic if visible. If the picture comes out too rapidly I brush again with gallic acid alone, or if too slowly with some stronger gallo-nitrate. After a few minutes I take it off the board and lay it, face down, on a small quantity of gallic acid solution in a paper tray, and allow the development to proceed until intense enough. The paper trays are exceedingly convenient; but care must be taken to *damp* the paper *before* making them, otherwise, when the solution is poured in, it all goes into creases, which, if they come in contact with the picture, cause streaks of imperfect development. It is not necessary to fix the negatives when away from home, as, if they are washed for a few minutes, first in plain water and then in water with a little salt, they may be kept a long time without injury.

Yours, &c.

Whitehaven, R. W. FORSTER.
March 23rd, 1857.

ANSWERS TO CORRESPONDENTS.

Edwin Gardner.—Received, with many thanks.

X.Y.Z.—Our correspondent requests information as to a *cheap* mode of constructing a glass house; and also whether a wood framework covered with oiled cloth would answer the purpose. The latter would decidedly not answer, as the active rays would be very considerably obstructed. Perhaps some of our readers who may have had practical experience on the former point will favour us with their advice.

W. Stainer—The circumstance is very curious, but not at all improbable. We do not think, however, that you can diminish the amount of iodide and cotton in the film below the quantities usually recommended, and at the same time increase the sensitiveness. 2. See Mr. Hardwich's paper.

M. H. P. H.—The cause has never been satisfactorily explained; it is not an unfrequent source of annoyance in all the keeping processes.

CONTENTS.

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

EDITED BY WM. CROOKES, Esq., 15, STANLEY-ST., BROMPTON, LONDON, S.W.

Published on the 1st and 15th of each Month.

[EW SERIES.] No. 9.—MAY 1, 1857. [Price 3d. Stamped 4d.

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 9.—MAY 1, 1857.

According to a promise given in our last number we now insert Mr. Maxwell Lyte's new Printing Process. It has been compiled from several papers and letters which he has from time to time communicated to the *London Photographic Journal;* and as we have used the process from the time of its having been first made public, we are, perhaps, qualified to speak concerning its advantages, or otherwise, over the processes at present in use. It is undoubtedly a great step in the right direction, and well merits the serious attention of all amateur and professional photographers. The manipulations are no more difficult than those of the chloride process; and, with the exception of the precaution to be taken against the presence of salts, which produce, with silver, compounds insoluble in nitric or phosphoric acid, no more than ordinary photographic care need be taken. The necessity of the presence of hyposulphite of soda is also obviated; and when, to say the least, great suspicions are entertained of the permanence of the photographic pictures which have ever been in contact with that salt, any method which will produce quite as good results without its employment, cannot fail to be productive of the most beneficial results. As regards their absolute permanence, of course time alone can decide: theory points to hyposulphite of soda as the principal destructive agent, and this source of fading is certainly eliminated; but by the same process of reasoning, it might, without much difficulty, be shown that at least a partial fading out was inherent in all prints taken according to the present practice of photography; inasmuch as the atmosphere itself, even in its normal condition, is likely to exercise a very marked action upon such an attenuated film of colour as comprises the generality of paper pictures.

We have also given in this number a paper by Mr. Guthrie, on the composition of chloride of silver, which has been darkened by exposure to light. All our readers, and more especially those of them who possess a knowledge of chemistry, will read the account of his experiments with interest. As far as the actual analytical numbers go, the results, we think, are quite trustworthy; but we can hardly accept, without further proof, the inference drawn from them—that the effect of the light is to separate the *whole* of the chloride from the silver. His results, however, are of more interest in a philosophical point of view than as in any way bearing upon the present practice of photography; for in this latter case, it must always be remembered that organic matters of different kinds, and varied energetic power, play an active part in upsetting the nicely poised affinities existing in the silver salt which is submitted to the action of light; and whether the dark part does not consists of a combination of silver and organic matter is also a disputed point.

We have great pleasure in drawing our readers' attention to the Exhibition of Industrial Arts which will be opened at Brussels in August of the present year. As was the case last year, a special section will be reserved for photography, which it is intended should include pictures of objects of a scientific or technical nature, and products of industry; artistic productions on the daguerreotype plate or glass; monuments, articles of vertû, landscapes, and portraits; artistic pictures on paper, linen, &c.; photographic engraving, and similar productions, such as photo-lithography, &c., and the various applications of heliography, &c. Exhibitors are particularly requested to state briefly the nature of the negative process employed, such as moist or dry collodion, albumen, waxed paper, or calotype: any other information, which they may consider of use to the jury, concerning the method employed in the negative or positive process, will also be received with interest. Photographs should be protected by portfolios or passe-partouts.

A commission will regulate the admission of all articles; and such as have been exhibited at any previous exhibition in Belgium will be excluded.

Prizes will be awarded to those exhibitors whose works seem to possess most merit, and their distribution will take place publicly. They will be of two kinds—medals and honourable mention; and in exceptional cases, there may be given special medals for excellence.

All persons who desire to take part as exhibitors, should state the same in writing, post paid, to the secretary to the committee of the association, 58, Rue Royale, Brussels. They are requested to state the kind of articles they may wish to exhibit, and the space they may require in length, breadth, or height. All articles for exhibition must be sent before the 25th of July, to an address which will be given in a future number, as soon as the arrangements are more matured.

The expense of carriage to and fro must be defrayed by the exhibitors. For such of the journey, however, as may be on the Belgian railways, there will be a reduction of fifty per cent. off the usual rates of carriage, both going and returning.

All possible care will be taken of the objects sent for exhibition; nevertheless, the association will not be answerable for any loss or damage which may take place.

The Art Treasures Exhibition at Manchester will be perpetuated by photography more completely, we hope, than the great national one of 1851. Already we hear that the Manchester Committee have arranged with Messrs. Colnaghi to produce a photographic series of the Exhibition. We likewise find that his Majesty the Emperor of Austria has conferred upon Mr. Paul Pretsch, inventor of the art of Photogalvanography, the Grand Gold Medal for Arts and Sciences, in recognition of the artistic perfection of the specimen prints which Mr. Pretsch has submitted to his Majesty.

In a further communication on the subject of Mr. Lyte's meta-gelatine preservative process, given in a former number, he writes as follows:—"If the plate is to be kept very long, and in warm weather, it may perhaps be found preferable to wash it in a bath of distilled water, to which has been added a grain or so of nitrate of silver to the oz., before pouring on the liquid; but as yet, the weather having always been tolerably cool since I have been working with the process, I have never found any difficulty in keeping the preserved plates for more than a week in the dry state."

Photography is steadily advancing towards the higher arts. This week we have been favoured with a view of two sets of exemplars—which are on their way to Manchester—of the recent progress in this delightful art; portraits by Mr. Claudet, and elaborate compositions by Mr. Rejlander. In both the artists have left mere photography far behind. Mr. Claudet is gradually changing his sun-shades into brilliant pictures—pictures of all degrees of finish, from the collodion portrait "touched" with a shading pencil, to the sparkling miniature produced upon a photographic groundwork by the hand of M. Mansion. Mr. Claudet is the Vandyke of photography: his sitters become persons of distinction. Mr. Rejlander continues his studies of composition by means of many negatives printed into one group; and his last production, an allegorical representation of "Life," is in many points masterly—worthy to be painted as a fresco. In the centre of the scene a venerable personage leads two youths through an open gate into the world of Manhood,—where, on one side, voluptuous Beauty beckons into the pleasure paths, which lead away to Licentiousness, Prostration, Insanity, and Death, personified by figures; and, on the other, Religion draws its chosen towards the paths of Duty, Industry, and Peace. In the fore-centre of the scene, connecting the two allegorical groups, crouches a fine figure of Repentance, with the limbs marvellously foreshortened. Altogether, as Mr. Rejlander means it to be, this composition is one for the artist to study late and early. Some of the details are ill chosen; the beings of photography are *all* of clay, and the sun brings out their imperfections; but the scene is painted in the light of Nature, and Nature is suggestive even when less beautiful than the imaginations of men. We advise our readers to look for this study in composition at the Manchester Palace. —*Athenæum.*

LIVERPOOL PHOTOGRAPHIC SOCIETY.

The Fourth Meeting of the Society took place at the Royal Institution, on Tuesday, the 21st instant, Mr. Berry in the chair.

After the disposal of the usual routine business, Mr. Keith read the following interesting paper on his "*Positive Collodion Process*":—

In coming before you this evening to read a paper upon a process, in which for three years I have occupied so pre-eminent a position, it may be asked how is it that, connected with this society as I have been from its formation, I have not brought it before you earlier. To this I think I have a sufficient answer. You are probably aware that I am practicing photography as a profession, and therefore I do not think it would have been wise for me to publish for the information of those whom I might, with reason, consider as my rivals in business, the experience I had with much trouble and expense acquired. The case is now altered; my business in chemicals is daily becoming more extensive, and therefore I have thought it incumbent upon me to give all the information I can to those who use my preparations, and to the photographic world in general.

Shortly after the discovery by Mr. Archer of the application of collodion to photography, I, in common with others, experimented in that direction; I was early impressed with the possibility of obtaining direct positive pictures. The first collodion positive I ever saw was one taken by myself; it was originally intended for a negative, and was taken on ground glass; it was then burnished with a tuft of cotton wool, when it presented the appearance of a very bad daguerreotype. Continuing my experiments, I fancied that I had made immense strides; I opened a room in Liverpool, and devoted myself exclusively to the production of positive collodion pictures, and I can assure you I thought them very beautiful. Sitters flocked in, and in the height of my vanity, I actually had the audacity to forward some of my productions to H.R.H. Prince Albert, and was much gratified to hear, through Dr. Becker, that H.R.H. was much pleased with them, and wished to purchase one of them; but my pride was destined to have a fall; I was about to receive "a heavy blow and sore discouragement." In the *London Photographic Journal* for October, 1854, appeared a letter from Mr. Sutton, B.A., of Cambridge in which, after predicting the speedy extinction of the collodion process altogether, he writes as follows:—

"It appears to me that in portraiture the daguerreotype stands alone and unapproachable. I have never seen a paper print from a collodion negative which was *in comparison at all presentable*, until re-touched by the miniature painter and positives in collodion have been entirely exploded."

And this, of a process of which I had thought so much. Henceforth, I could only look upon myself as one of a proscribed class, banned and outlawed from all claim to the scientific, in fact a very Pariah of photography, if I were to regard with becoming reverence the censure of so talented an individual as a B.A. of Cambridge, who certainly ought to know s

ıch better than I, a poor pretender to the ɔfession of photography; henceforth no posi- ʻes on glass could be regarded as worthy oductions of the camera, and in common with ıny others I have been obliged to content yself with mere emolument, and although :tunate enough to secure a tolerable amount patronage, it has always been a source of gret to me that these patrons should have far misapplied their taste as to have looked th favour upon such miserable productions.

But retraction seldom comes too late; a man acknowledging an error, either of opinion or :t, is merely admitting that he is wiser to-day an he was yesterday. The same learned thority, for reasons which could have no ation to his own pecuniary benefit, now sees to exalt this much deprecated process to as gh a pitch of commendation as he had before wered and degraded it.

The first symptoms of relenting appear in *otographic Notes* for December 15th, 1856. He ere speaks of it as "a method so satisfactory ıen properly conducted." It is a singular incidence that the same number contains the st advertisement of a new positive collodion, ıde and sold by the author. In the publication January 15th, 1857, he speaks of the extra- linary development of the positive process ring the past year, and even goes the length saying, "A really fine glass positive, bold in lights, vigorous in the blacks, and delicate the half-tones, may, I think, be considered highly artistic work."

To return, now, to the positive process, as ıctised by myself. I would recommend all to ıom the slight difference of expense is no ısideration to use the patent plate glass. The icle known as polished crown is very good, t one side is frequently so rough that the ference may be felt by rubbing the finger er the two surfaces. If the picture is taken that side it is inevitably fogged. The oured glass, (which was first introduced by ,) is also very good when carefully selected. o not find it necessary to take the extraordi- ry precautions in cleaning the glass which ıny practitioners have recommended. For w glass, simple polishing with a leather is suffi- ent. If the pictures have been dried on the ıss, or even varnished, a little wood naptha ll soften them so that they may be washed in ıin water, dried with a soft towel, and finally lished with a leather.

In regard to the collodion I cannot do better ın again quote Mr. Sutton. "I am aware that s article is in one respect incomplete, viz.— ıt I do not describe the composition of the lodion; but I can assure the reader that it ɔuld be no act of kindness to him were I to do He could not purchase anywhere the ma- ials with which I work, nor could I describe words a manufacture to which an apprentice- ip should be served before it could be success- ly conducted. I trust that my labours may ıd in some degree to advance the art, by ıcing an uniformly good and cheap collodion the hands of the operator."

The remainder of my process is so widely dif- ent from the usual theory of positive pictures, at I have no doubt it will excite some sur- prise. Professor Hardwich, a worthily acknowledged authority upon photographic chemistry, states that you should use a thin and lightly iodized collodion, a weak and slightly acid bath, and a developer which will bring out all the details immediately. I have no doubt good pictures may be produced by this method; but mine is the very reverse. The collodion I employ is strong and fully iodized, and contains a proportion of free bromine, an improvement *first introduced by myself.* The composition of the bath is as follows:—

Crystallized nitrate of silver	1 oz.
Iodide of potassium	5 grs.
Water	2 oz.

Shake the mixture until the iodide of silver first formed is dissolved, then add 10 ounces more water, and, after filtering carefully, 24 minims pure nitric acid.

Allow the collodion to set pretty well before placing in the bath. When the film of iodide is fully formed, which at an ordinary temperature will be in about two minutes, remove the plate, drain for a few seconds on blotting paper, and then expose in the camera.

To develope take

Protosulphate of iron	1½ oz.
Nitrate of baryta	1 „

Place them in a bottle, and pour over one pint boiling water; stir the mixture, and when thoroughly dissolved, filter. When cold, add

Pure nitric acid	40 minims,
Spirit of wine	1 oz.

Pour this mixture evenly over the glass, and allow it to act until the lights of the dress just begin to appear, then wash with water. For fixing, I use—

Cyanide of potassium	1 oz.
Nitrate of silver	60 grs.
Water	20 oz.

The silver is in the first instance precipitated as cyanide, but is immediately re-dissolved. I consider that by this addition the energy of the solution is reduced, and probably a coating of metallic silver thrown down. The picture has then only to be washed copiously in water, dried, and varnished.

How remarkably similar is this to Mr. Sutton's formulæ given in a recent number of the *Notes.* It is singular that two individuals, without any communication, should hit upon formulæ so near alike, and yet so different from any before published. I can refer to many personal friends, whose veracity is undoubted, that I gave them the same formulæ two or three years ago.

In conclusion, I can only say that I have never seen any of Mr. Sutton's productions, nor do I intend to invest ten shillings in the purchase of "a superb example of the capabilities of this process;" but I have a case of pictures in the Government Exhibition now open in Liverpool, which I think are fully equal to any hitherto produced.

Messrs. GLOVER and BOLD brought forward some specimens of photographs of a very novel and valuable kind, executed under their patent, including watch and chronometer dials, indices for gas meters, address panels for piano-fortes, compass registers, &c. &c., which excited considerable notice. As the specification of the process is not yet published, the patentees did

not feel themselves justified in proceeding to any lengthened description of the *modus operandi*, but explained that they were produced on white enamelled glass, from negatives, in some instances by direct contact, in others, through the medium of the camera from negative patterns inscribed for the purpose. The pictures themselves gave no indication, in their appearance, of a photographic origin, the black lettering on the dials being as vivid as that on ordinary watch faces; the different tints of the enamelled surface being similarly imitated with accuracy. Copies of prints or original pictures, statuary, views from nature, elaborate and otherwise costly designs, might be readily transferred by this plan to lamp-glasses, transparencies, &c., for general decorative purposes, the delineation being in all cases clear and decisive on the white semi-transparent ground.

Mr. Keith exhibited some very interesting paper photographs, from collodion negatives, of the ceremony of laying the foundation stone of the Free Library, as well as some large portraits of distinguished local celebrities then present.

The meeting then terminated.

MAXWELL LYTE'S NEW PRINTING PROCESS.

"In continuing my experiments on photographic printing, I have hit on a process which is very remarkable, as threatening completely to abolish hyposulphite from the photographic laboratory. It depends on the sensibility of phosphate of silver (a property first alluded to by Dr. Fyfe), and its complete solubility in an acid liquid. I have already produced very fine results by its means, and see a fair promise of subsequent improvement. The method, as I employ it at present, is as follows:—The paper is salted on the following bath:—

Phosphate of soda......	2 ozs. 4 drms.
Rochelle salt	5 drms.
Sugar of milk.	2 ozs.
Gelatine	1 drm.
Water	40 ozs.

"The process is also very successfully applied to albumen, and for this purpose take the following:

Albumen............. ...	½ pint.
Water.....................	½ pint.
Phosphate of soda......	10 drachms.
Acetate of soda.........	5 drachms.
Sugar of milk...........	1 oz.

The three last to be reduced to fine powder: mix them all together and whip them up into a fine froth, as for the ordinary process. When settled, take the clear liquid and, having strained it, pour it into a dish.

"Prepare the paper on either of these liquids just as usual. Sensitize with a bath of nitrate of 20 per cent. Print as usual, only remember that in this process the picture loses nothing in the fixing, so do not print too dark. To fix the proof, I make roughly a solution of phosphoric acid by adding nitric acid* to phosphate of soda. Take

Phosphate of soda	13 oz.
Water	42 oz.
Nitric acid	8 oz. by weight.

* The nitric acid above mentioned as to be added to the phosphate of soda, is the strength most commonly found in commerce, namely 35° Beaumé, which is the same as 1·32 pec. grav.

Pound the phosphate of soda and mix them a[ll] together: when dissolved they are fit for us[e]. After remaining in this bath for five or si[x] minutes it is completely fixed, which may b[e] known by the disappearance of all the yello[w] colour of the phosphate in the light parts of th[e] proof.

"To wash the proofs I pursue the following pla[n]:

"Six porcelain or gutta-percha dishes ar[e] ranged one beside the other and filled with clea[r] rain-water, and through these all the proofs a[re] passed in rotation after leaving the phosphor[ic] acid bath. They are allowed to remain a sho[rt] time in each bath, being turned over in it onc[e] or twice. On coming out of the 6th tray the[y] will be found completely washed and ready f[or] the colouring-bath.

"When bath No. 1 is found to be much charge[d] with silver, as it will be in a short space [of] time, it is to be emptied into some convenie[nt] vessel, to be treated for the recovery of i[ts] waste silver. No. 2 bath is to be emptied int[o] No. 1, No. 3 into No. 2, and so on, till No. [6] being empty is to be filled with rain-water. I[n] order to recover the silver from the bath No. [1] which has been emptied away, add to it a littl[e] solution of common salt, till all the silver [is] precipitated as chloride. A similar treatme[nt] is to be pursued in order to purify the phosph[o]ric acid bath itself, when it gets overcharge[d] with silver, as is described below. By th[is] system of washing the trouble of carrying wat[er] is much economized; and at the same time N[o.] 1 bath, into which the proofs are plunged o[n] first coming out of the phosphoric acid, an[d] when consequently they are still highly charge[d] with silver, can contain no traces even of chl[o]rides, as it must always contain a slight exce[ss] of silver, and it is difficult to procure even rai[n] water at times without minute quantities [of] chlorides in it.

"It is now fit for the colouring bath. The be[st] colour is produced, as far as I have yet seen, b[y] the use of Mr. Sutton's bath of *sel d'or*, an e[x]cellent method of making which has been give[n] by Mr. Hardwich in the London *Photograph[ic] Journal*, No. 35. As this salt, however, contai[ns] hypo in a small proportion, it may be deeme[d] an advantage to fix without hypo at all. A go[od] bath, giving very fine tones, is composed [as] follows:—

Chloride of gold	15 grains.
Common salt	3 grains.
Hydrochloric acid	2 drops.
Water	1½ pint.

In this liquid the proof colours nearly, if n[ot] quite, as well as in the *sel d'or*.

"If the proof be thought too dark wh[en] finished, it may, after being passed throu[gh] a bath of water in which has been dissolved [a] bit of carbonate of soda, be placed in a bath [of] very weak cyanide of potassium, not more tha[n] 2 or 3 to 1000 of water. Great care is howev[er] requisite in this treatment, as the action of th[e] cyanide is most energetic even when thus di[]luted; otherwise, after a short washing wit[h] one or two changes of water, it may be deeme[d] fixed, and ready to be dried and finished. [It] should be rubbed, when mounted, with th[e] encaustic of wax and turpentine.

" I must also add one or two words of caution fore concluding. The reason of adding the etate of soda is for the double purpose of utralizing the nitric acid set free by the de- mposition of the nitrate of silver and phos- ıate of soda, and also to give an increase of nsibility, which it appears to do.

" The nitric acid, phosphate of soda and water e intended to produce an extempore solution phosphoric acid, but a solution of that acid the pure state may be perhaps substituted th advantage. When the liquid ceases to t, it is because it is saturated with silver. l that is then required is to add most cau- usly some hydrochloric acid, which will ecipitate all the silver as pure chloride, and ıve the phosphoric acid free, and ready to act er again. Great care must be taken that no cess of hydrochloric acid be added; but if by stake this be the case, a cautious addition of ne nitrate of silver solution will again extract all.

" Nitric acid should be tried to see if it pre- itates with dilute nitrate of silver solution. e phosphate of soda and the acetate must o be tried, to see if the precipitates they form completely soluble in nitric acid; if they ve any insoluble residue they are unfit for e.

" The phosphate and acetate of soda being orescent salts, should be kept in a corked tle, otherwise they are liable to vary in com- sition. If the albumen is to be kept, a drop so of oil of cloves or camphorated spirit, led to the water before mixing, will be found vantageous as giving it more keeping qualities.

" This process is so successful that I now never ploy any other, and find that with it I can nt and finish at least twice as many proofs the day as with the old process. It is more id, gives, many think, finer tones, and re- res no over-printing; offers extreme facilities collecting the waste silver, of which enor- us quantities were lost by the old method, l, best of all, *avoids entirely the use of hypo in shape or form.* I may add that the pictures ibited by me at the Crystal Palace are all e by this process.

Fine proofs may also be made by this method h development. The paper being sensitized before, is exposed for just a second or two, l then placed in a solution of gallic acid. ıen it arrives at the required strength, it is be fixed in the acid bath, and then to be cd and washed as before described. The nting, however, of positives by development ttended by the one drawback, that we can- watch the progress of the impression.

IANCHESTER ART TREASURES EXHIBITION. —The gallery round the north end of the tran- t will be devoted to the exhibition of a nerous and interesting collection of photo- phs, arranged by Mr. Delamotte, himself a ful photographer. The collection consists samples of all our best photographers, and ludes portraits of many of the most dis- guished men of the present day. Prince bert is a most liberal contributor to this artment.—*Times.*

ON THE ACTION OF LIGHT UPON CHLORIDE OF SILVER.*

BY FREDERICK GUTHRIE, B.A., Ph.D.

Assistant in the Laboratory, Owen's College, Manchester.

THE blackening produced by light upon chlo- ride of silver was ascribed by Scheele to the liberation of chlorine and the deposition of me- tallic silver. He proved that the blackened mass was only partially soluble in ammonia, and that the portion which remained undissolved by this re-agent was soluble in nitric acid. Daniell and others considered the blackening to be due to the formation of oxide of silver, imagining the decomposition of the water pre- sent by the chlorine to be accompanied by a corresponding oxidation of the reduced silver; others again have supposed the formation of a sub-chloride.

The few experiments which I subjoin tend, unmistakably, to support the view originally advanced by Scheele.

1. Two or three grammes of dry chloride of silver were sealed in a glass tube, and exposed to direct and diffused sunlight. There was an in- creased tension in the tube; chlorine was shown by the iodine test to be present in the free state.

2. A portion of chloride of silver, dried at 100°, was introduced into a perfectly dry tube. The tube being then half filled with pure and dry benzol, and heated until the boiling of the benzol had expelled all the air, was hermetically sealed and exposed with agitation to the light. The rapid blackening which the chloride here underwent proved the presence of oxygen to be unnecessary.

3. Four or five grammes of moist chloride of silver were sealed in a tube. The tube was half filled with water and hermetically sealed. After exposure to the light for ten or twelve days, with frequent agitation, it was opened, the contents thrown upon a filter, and washed with cold water. On adding nitrate of silver to the filtrate, a precipitate of chloride of silver was formed. The grey mass on the filter was treated with strong ammonia, until the latter ceased to dissolve any more of the unaltered chloride. There remained on the filter a slaty grey body, which, in the dry state, took the metallic lustre under the pestle; this body was soluble in dilute nitric acid, not reprecipitable by ammonia, but precipitated by dilute hydro- chloric acid. The non-precipitation of the nitric acid solution by the most gradual addition of ammonia, seemed already to point to the ab- sence of chlorine.

4. About ten grammes of the moist chloride were introduced into a tube of $1\frac{1}{2}$ feet in length, and $\frac{3}{4}$ in. internal diameter. After adding water and sealing, the tube was exposed as before. The supernatant liquid was poured off, and the mass washed by decantation; the hy- drochloric acid was thrown down by nitrate of silver; the chloride of silver was estimated on a weighed filter; when dried at 100° it weighed 0.2125 grm.

The washed material from the tube was digested with strong ammonia; the slaty grey residue which subsided, leaving the liquid above quite clear, was collected upon a weighed filter

* From the Quarterly Journal of the Chemical Society, Vol. x. part 1.

and washed, first with ammonia, then with water; dried at 100°C, it weighed 0.1756 grm.

This substance assumed the metallic lustre under the burnisher. It dissolved in warm nitric acid, decomposing the latter; the substance, together with the filter, was thrown into strong nitric acid; after digestion and dilution it was filtered; the silver was thrown down by dilute hydrochloric acid, collected on a weighed filter and estimated; after being dried at 100°C, it weighed 0.2254 grm.

Supposing now the grey substance obtained to have been metallic silver, it should have given 0.2333 grains of chloride.

The amount actually obtained, though too small, is yet sufficiently near to the calculated quantity to show that the original chloride of silver subjected to the light had really undergone decomposition into chlorine and metallic silver. That the chloride of silver obtained from the hydrochloric acid found in the tube, on breaking it open, was somewhat smaller than that from the silver, was probably due to an escape of a portion of the free acid by evaporation during manipulation.

5. About twelve grammes of the chloride of silver were introduced into a tube; the tube was then half filled with fuming nitric acid, sealed and exposed as before. On opening the tube, it was found to contain hydrochloric acid. The chloride was found to have undergone a blackening quite as deep as that which had taken place in chloride of silver surrounded by water, which was exposed to the same light for the same time. On treating the contents as in experiment (4), there was found 0.1643 grm. of the grey substance, which gave 0.2040 grm. of chloride of silver.

The quantity, supposing the substance to have been silver, should have been 0.2183 grm. of chloride. This is sufficiently near to show that the substance in question was nothing else than metallic silver.

6. Confirmatory of experiment (5).

7. The circumstances were as in experiment (5), excepting that the nitric acid employed was more dilute. On treating the contents as in experiment (4), I found 0.2207 grm. of grey substance, which gave 0.2870 grm. of chloride of silver instead of the calculated quantity 0.2932 grm.

In experiments 4, 5, 6, the grey substance, when dry, assumed the metallic lustre under the burnisher.

The fact that the chloride of silver was reduced to the metallic state, even in the presence of nitric acid, was quite unexpected. I found that neither by removing the affected mass from the light, and agitating it, nor even by warming it, was the original whiteness restored; indeed, the silver was only very gradually attacked by boiling nitric acid, unless the undecomposed chloride had been previously removed by the action of ammonia. It seems as if the light in reducing the silver, *in spite* of the nitric acid, had thereby thrown it into a more passive state, and that only after contact with the alkaline ammonia was its original basic condition restored.

The chloride of silver used in these experiments was, in every instance, washed by decantation, in order to avoid the presence of organic matter.

NEW SELF-DEVELOPING NEGATIVE PROCESS.

By C. J. Muller, Esq.

While in India, in 1851, I communicated to th *Athenæum* a photographic process with nitrat of silver, nitrate of lead, and iodide of iro This was in truth a modification of Dr. Wood catalysotype, though, at the time I discover the process, I was not aware of Dr. Woods' u of iodide of iron in photography. Subsequent I reduced the process to one of greater sin plicity by omitting the use of nitrate of lea The paper was in the first instance floated f three or four minutes on the surface of a bath nitrate of silver of the strength of 25 grains the salt to one ounce of water. It was th removed to a slab of glass, on which had be placed a piece of clean bibulous paper, and glass tube, about half an inch in diameter, w rolled over the wet surface. This remov superfluous moisture and improved the surfa of the paper. Two or three minutes afterwar when the paper no longer glistened with moi ture, it was placed on a bath of iodide of iro containing 6 or 7 grains of iodide of iron in o ounce of water. Here it was left for about quarter of a minute (longer exposure gave *insensitive* paper). It was then removed to t dark slide, being placed behind the glass wi the prepared surface in close contact to It was exposed in the camera without dela and generally gave fine pictures in 15 secon under favourable circumstances. No developi agent was required. The definition was tremely fine, and the lights remarkably cl and brilliant.

On printing positives from negatives th obtained, I found, however, that the sky ne possessed enough opacity to resist, sufficien long, the action of the light upon the positi paper, so that this portion of the picture in t positive was always more or less darkened. examination of the sky of the negative un the microscope, showed that only the superfic fibres of the paper were darkened,—all bel remained perfectly white, and the spaces tween the superficial fibres were not filled with darkened iodide of silver. This at o accounted for the defect, and I was led to m experiments for the purpose of obtaining a p fect *superficial* picture, wherein the darke portions should exhibit no transparent int stices under the microscope.

I was compelled to abandon my experim in consequence of ill-health, but I still entert the idea, that it is practicable to obtain wh have sought for: I require a *superficial* pict because this alone is consistent with per definition and the highest degree of sensit ness, as in the process on glass. In the o nary Talbotype the picture is more or les the substance of the paper, and the definitio consequently less perfect than it is in pictu on glass. The picture is a *thick* one in an perfectly transparent substance, whereas perfection it should be a *thin* one.

In the course of my experiments I found t a modification of the process above mentio ensured complete opacity in the darkened pa but at the same time, the picture was in substance of the paper, instead of on the s

and the definition therefore imperfect. ; process may be considered interesting ɔerimenters in photography, I give the ılars.

ıove from Sanford's or Whatman's nega-ɪaper, all the sizing, by maceration in acidulated with nitric acid, and subse-washing in distilled water. Lay the wet on a table covered with a clean cloth, free tarch, and allow them thus to dry. The should be perfectly bibulous after this ıent.

dry paper is placed on the surface of a ɔf iodide of iron containing about ten of iodide in one ounce of water. It is d to repose on this for one minute, when emoved by means of wooden forceps and ret side downwards, on a sheet of clean and left to dry. This part of the process e performed many hours before the paper de sensitive. When required for the a, it is placed upon a bath of nitrate of containing fifty grains of the salt and ınce of water. If the paper be required p good for an hour or two, it must be left ; bath for five minutes; if to be used im-tely, and all the conveniencies of a labo-are at hand for the treatment of the e after removal from the camera, then it be left on the silver bath for about one e only. The degree of sensitiveness, or the rapidity of development, will be found end in inverse proportion upon the dura-f exposure to the silver bath. On removal the bath the paper is placed, prepared ɔwnwards, upon the glass of the slide, so when exposed it lies behind the glass. ɔf thick cardboard placed under the glass revent the paper from coming into contact the wooden partition of the slide. If the has been one minute in the silver bath, xposure in the camera should be for about minutes. If it has been five minutes in lver solution, the exposure should be from o ten minutes. My experience is of the e of India.

additional developing agent is required, xisting already in the substance of the in the proper proportion, in the shape of e of iron. The picture is developed quickly wly, according to the time the paper has in the silver bath. It may be perfectly ı ten minutes, or it may take an hour. ights will not spoil until after the picture npletely out. The dark parts are of in-blackness and the most complete opacity, he picture is completely in the substance paper. The proof should then be washed in distilled water, or in common water ly acidulated with sulphuric acid, and quently fixed by means of hyposulphite of The object of acidulating the water is to nt the formation of a deposit of oxide of vhich would otherwise make its appearance oil the picture.

ıch paper, or paper sized with starch, will ıswer for this process, as it is very diffi-to render perfectly bibulous. Sanford's Whatman's papers are very coarse in tex-when the sizing is removed, and therefore ɔictures obtained on them are of inferior definition. What is required to produce the best results with this process is paper mode-rately thin, of fine texture, and made of *one* description of fibre. In Sanford's paper there are, I think, two descriptions of fibre, one of which freely takes wax and becomes *transparent*, the other resistant to wax and *opaque*,—and these two sorts of fibre seem to me to become sensi-tive in different degrees, under the influence of the chemicals used. I consider it of the highest importance in photography on paper, that the paper should be composed of one kind of fibre only.

My experiments have also led me to enter-tain the opinion that all organic sizing is in-jurious in photographic processes on paper. Theoretically, we require only a vehicle for the chemicals necessary in the process, and that vehicle should be a substance which has no chemical action, as glass, for instance. A vehicle of this description, with the properties of paper, is not perhaps obtainable, but in the absence of a better, it is, I think, desirable to employ paper chemically pure, and composed of one species of fibre only, and the best seems to me to be cotton.—*London Photographic Journal.*

THE PREPARATION OF GALLIC ACID.

By F. Steer.

The author's process is essentially a combina-tion of the modes of preparation long since described by Scheele and Braconnot. 100 lbs. of the best black Turkey galls are pounded as fine as possible, stirred up with water into a thin paste, and left standing for ten days, during which it is frequently stirred, and mixed with fresh water to replace that which is absorbed. Towards the end so much water is added that after it has quietly settled there may be three inches of it at the top; the supernatant fluid is decanted and preserved.

The paste which remains is put into a wooden vessel, adapted for extraction by displacement by water; everything soluble is then extracted.

The whole of the extracts are poured toge-ther, allowed to settle completely, decanted and strained into large stone-ware dishes, which are placed in winter in the neighbourhood of a warm chamber stove, but in summer in the open air, lightly covered. They are left standing until all the gallic acid has separated, for which purpose from three to four months are required. The mother liquors are poured off, and the yel-lowish-red gallic acid, which crystallizes in transparent tubes, is washed several times with distilled water and dried. From the above quantity 24 pounds of gallic acid are usually obtained.

Before this acid is bleached, it must first of all be freed from the flocculent resinous matters, which would otherwise stop up the filter. The acid is dissolved in boiling distilled water, allowed to settle whilst warm, and decanted into another glass flask; pure animal charcoal is then added to it, and it is again heated and fil-tered, whilst hot, through white filtering paper. The filtrate is heated afresh, poured into the crystallizing dish, which must previously be warmed, and left to stand quietly and well covered for twenty-four hours.

The crystalline cake, when taken out, must

be immediately wrapped up in white filtering paper, as otherwise the moist apices of the crystals are rendered black by ferruginous dust-particles floating in the air; subsequently the black colour diffuses itself to the bases of the crystals, which, however, produces a remarkably beautiful appearance.

Although gallic acid is but little employed at present, except in the preparation of pyrogallic acid for photography, it is, nevertheless, to be expected that it will one day find frequent employment in dyeing.—*Chemical Gazette.*

Photography will shortly achieve new conquests. Mr. R. Morrison, a gentleman attached to Lord Elgin's Embassy to Pekin, will take out with him a most complete set of apparatus and chemicals for photographing the Celestials, and from what we know of this gentleman's artistic skill and delicacy of manipulation, we do not doubt that both diplomacy and photography will be equally effective in adding new laurels to our country.

ANSWERS TO CORRESPONDENTS.

Sunshine.—In addition to what you already have, no more apparatus is required for out-door photography than a tent, or something of the kind, to prepare and develope the plate in. A portrait lens will do for landscapes if it be stopped down by a diaphragm in front of it about half an inch aperture; but the field will be always rather limited, and consequently single lenses are preferable. The dark streak on the plate is most probably owing to your thumb having been in contact with the liquid on the surface at the upper part, and then the contaminated solution flowing over the plate.

R. S. Dawson.—Your suggestions have been forwarded to the parties mentioned, but we do not think they can be adopted. If no sulphuric acid be added, the conversion into metagelatine will be very tedious, and at the best imperfect.

A. R. M.—The spots are most likely due to small particles floating in the collodion; allow it to stand for a few days, and then carefully decant the upper portion for use.

G. S. P. and E. Gardner in our next.

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The
'iverpool & Manchester Photographic Journal.

New Series. No. 10.—MAY 15, 1857.

readers will peruse with the deepest regret announcement of the death of Mr. Frederick t Archer, which was made to the Photo-hic Society of London on the 7th instant.

will always be a source of pleasure to the lemen of the Manchester Society to feel the last moments of the discoverer of the ess which is now enabling hundreds of ons to live in affluence, and affording em-ment to tens of thousands of others, were hed by the reflection that at length his as to being the true discoverer of this ical process were being, in one quarter, gnised. They who so generously contri-d to the pecuniary testimonial which was to this true benefactor of his country only w weeks before his decease, will also be ngst the small number of those to whom e it will not be a reproach that his merit with no reward. We cannot now repair the tice which, to our shame be it spoken, em-red, and perhaps hastened his end. But it ill in our power to offer some tribute of ect to his memory. The wife and family of to whom all photographers owe an ever-ng debt of gratitude, are left *destitute;* and know that such a case needs only to be tioned to cause every photographer in the try to come forward and save us from what otherwise, indeed, be a national disgrace.

r the first time since our editorial connec-with this *Journal*, we have to congratulate readers on a subject which is a source of igned regret to ourselves. The decision h the Council of the Photographic Society ved at in their selection of Secretary and or to their *Journal*, although very flatter-to ourselves personally, has placed this nal in an anomalous position. It was in e danger of losing the strictly independent tion which it occupies, and of becoming ere secondary echo of the parent society's ions. A change of ministry was imperatively necessary; and if anything could make the fare-well to our readers less painful, it would be the thought that the mind which in future will guide the destinies of our foster-child, is of such high order, and such established reputa-tion, that had not this *Journal* already gained a place in the foremost rank of scientific lite-rature, it would at once have taken up its position there. As a skilful photographer, a profound scientific chemist, an eloquent and critical writer, and one long accustomed to grapple with the deepest mysteries of science, Mr. Malone has scarcely a rival: to him we un-hesitatingly resign our charge.

In the *Quarterly Review* for April last there is an article on "Photography," in which the pro-gress of the art from Davy and Wedgwood to our own time is discussed. Six-and-twenty pages of essay on such a subject, we are glad to say, cannot help containing many ideas and parallels which are well worth noticing; but, at the same time, we confess it is with a feeling near akin to anger that we see ushered into the world, under these high auspices, such a one-sided, unjust, and incorrect collection of statements.

Unfortunately, any society,—unless the ma-nagers thereof are chosen for their practical acquaintance with business rather than for their theoretical knowledge of science,—is liable to degenerate into a little coterie of gentlemen, each riding his own particular pet hobby, and innocently wishing to mount his neighbours' behind him. Where was a society yet established on perfect principles? Photographers are as-suredly not exempt from that law which pro-claims that the too exclusive following of any abstract line of thought gradually elevates and purifies the intellect, so that at last it is ren-dered unfit to grapple with the uncompromising, selfish realities of this world's business; and so possibly the leading Photographic Society in the world may, at some of its meetings, have

had loud assertion mistaken for argument, and at others rather too much importance given to subjects which longer reflection would show to be hardly deserving of so much warmth; but the reviewer assuredly must have quaffed but a very limited number of times at the fountain head to have brought away such an impression of its meetings as is given in the following extracts, in which we recognise all the faults without any of their redeeming points of interest:

"Thus, where not half a generation ago the existence of such a vocation was not dreamt of, tens of thousands are now following a new business, practising a new pleasure, speaking a new language, and bound together by a new sympathy.

"For it is one of the pleasant characteristics of this pursuit that it unites men of the most diverse lives, habits, and stations, so that whoever enters its ranks finds himself in a kind of republic, where it needs, apparently, but to be a photographer to be a brother. The world was believed to have grown sober and matter-of-fact, but the light of photography has revealed an unsuspected source of enthusiasm. An instinct of our nature, scarcely so worthily employed before, seems to have been kindled, which finds something of the gambler's excitement in the frequent disappointments and possible prizes of the photographer's luck. * * * * * * The very talk of these photographic members (of the Photographic Society) is unlike that of any other men, either of business or pleasure. Their style is made up of the driest facts, the longest words, and the most high-flown rhapsodies. Slight improvements in processes and slight varieties in conclusions are discussed as if they involved the welfare of mankind. They seek each other's sympathy, and they resent each other's interference with an ardour of expression at variance with all the sobrieties of business and the habits of reserve; and old-fashioned English *mauvaise honte* is extinguished in the excitement, not so much of a new occupation as of a new state."

The conclusion of the paragraph from which we have extracted the above, contains an incorrect statement, in which the unfortunate King of Naples is, in this instance, painted blacker than he deserves—who "alone, of the whole civilized world, has forbidden the practice of the works of light in his dominions." It is almost needless for us to assure our readers that this is not the case, although the writer can refer to a former number of the Journal of the Photographic Society as his authority.

"Our chief object (he continues) at present is to investigate the connection of photography with art—to decide how far the sun may be considered an artist, and to what branch of imitation his powers are best adapted."

Here then is the key to the whole mystery. The writer is evidently an artist, possessing but a very shallow acquaintance with the principles of the science, as the following delicious bit of pseudo-chemistry will show:—

"It may not be superfluous to all our readers to state that the whole art, in all its varieties, rests upon the fact of the blackening effects of light upon certain substances, and chiefly upon silver, *on which it acts with a strong decomposing power*. The silver being dissolved in a strong acid, surfaces steeped in the solution became *encrusted with minute particles of the metal*, which, in this state, darkened with increased rapidity."

Passing over an historical summary of the progress of the art, we come to the first introduction to the world of Daguerre's discovery, and we quote the following graphic accoun[t of] a remarkable scene in the French Cham[ber] with the more pleasure, since it shows that the writer confined himself to facts instea[d of] opinions, the essay could not have failed [to] interest his readers:—

"The question before the deputies was this:— Daguerre and Niepce, jun., (for the partnership all the advantages of Daguerre's discovery to son of his late colleague,) were possessed of a s[ecret] of the utmost utility, interest, and novelty to civilised world—a secret for which immense s[acri]fices of time, labour, and money had been m[ade] but which, if restricted by patent for their protec[tion] would be comparatively lost to society. A com[mis]sion had therefore been appointed by the Fr[ench] Government to inquire into its merits, and the s[ecret] itself entrusted to M. Arago, who succeeded at in executing a beautiful specimen of the art. practically convinced, he addressed the chamber speech which is a masterpiece of scientific sum[mary] and philosophic conclusion. He pointed ou[t the] immense advantages which might have been der[ived] for example, during the expedition to Egypt, means of reproduction so exact and so rapid. observed, that to copy the millions and millio[ns of] hieroglyphics which entirely cover the great m[onu]ments of Thebes, Memphis, Carnac, &c., woul[d re]quire scores of years and legions of artists; whe[reas] with the daguerreotype, a single man would s[uffice] to bring this vast labour to a happy conclusion. quoted the celebrated painter, De La Roche, i[n tes]timony of the advantage to art by designs as p[erfect] as possible, and yet broad and energetic—wh[ere] finish of inconceivable minuteness in no respec[t dis]turbs the repose of the masses, nor impairs i[n any] manner the general effect. The scene was F[rench] in the highest sense—at once scientific, patrioti[c, and] withal dramatic,—France herself, treating fo[r the] creations of genius on the one hand, and o[n the] other dispensing them as gifts to the [whole] world. It was repeated in the Chamber of [Peers,] who, in addition to other arguments addressed by M. Gay-Lussac, were reminded with a French touch, that even a field of battle in phases may be thus delineated with a pre[cision] unattainable by any other means! The resul[t was] that a pension of 10,000 francs was award[ed for] the discovery—6000 to M. Daguerre, 4000 t[o M.] Niepce. The seals which retained the secret broken, and the daguerreotype became the pr[operty] of the world."

We next come to a most unjust mis-state[ment,] by which it would be imagined that MM. F[izeau] and Claudet were the only perfectors o[f the] Daguerreotype since the date of its disc[overy.] We are quite sure that both these gen[tlemen] have their reputations too firmly based to [require] such a wholesale appropriation of the labo[urs of] the other numerous and earnest truth-s[eekers] in the art; and this latter philosopher m[ight with] good grounds complain of the officio[usness] of a friend who gives the following inco[mpre]hensible jargon, as one of the two steps to[wards] perfection which are worthy of especial [atten]tion:—

"———— at the same time, by a prolonga[tion] of a part of the process, he has, without the [aid of] mercury, at once converted the image into [a posi]tive, the silver ground now giving the lights, i[nstead,] as before, of the shades of the picture."

Since the picture, as usually obtaine[d, is a] positive, we are at a loss to know how it [can be] *converted* into a positive by changing the [shades] into lights.

[gl]ancing over the next few pages we find no re[as]on to modify our assertion of incorrectness in th[e] statements. For instance, in mentioning the t[he] almost simultaneous discoveries of Talbot a[nd] Daguerre—by the confused manner in which t[he] exact date of publication in the case of the f[orm]er gentleman, and the first vague announcem[en]t of the discovery of the latter, are jumbled t[og]ether, the reader is led to imagine that they w[er]e perfectly coincident in date; whereas, in th[e] case of Daguerre, the full publication of the s[ubj]ect (which alone must be compared with T[al]bot's paper to the Royal Society), did not t[ak]e place till six months later. Again, it is s[tat]ed that an "immediate impulse was given" t[o] the discovery, "by the Rev. J. B. Read rec[om]mending the use of gallic acid." We will n[ot] deny that this experimentalist made use of ti[nc]ture of galls in some of his preparations; b[ut], as he was induced to try this by knowing th[a]t white leather was a more sensitive medium th[a]n paper, it is evident that it was the *tannic* a[ci]d which he supposed was the active agent, a[nd] not the *gallic* acid; which, besides being a to[ta]lly different body, is only present in the ti[nc]ture in very small quantities.

[T]oo little credit is next given to Talbot, on a[cc]ount of his directions being "too vague for th[e] tyro." This assertion has been so often m[a]de, that the public are beginning, we fear, t[o i]magine that it is the case; but a more unf[ou]nded prejudice never existed. Let the simple d[ir]ections given in Talbot's specification, and t[he] most recent and voluminous account of the b[ea]utiful collodion process, be placed in the h[a]nds of any one, totally ignorant of photog[ra]phy, but of ordinary intelligence and habits o[f] cleanliness, and we have no hesitation in a[ffi]rming that he would become a perfect master [of t]he former process before, in the latter, he had [qui]te made up his mind which way to prepare [the] gun-cotton, or whether his bath should be [aci]d or neutral. The only difference that we [can] see between the original description and [tha]t of Mr. Cundell is, that the former presup[pos]es the reader to be possessed of common [sen]se, whilst the latter gentleman addresses [hin]self to those who are unhappily deficient in [tha]t article.

[W]e have stated that the writer evidently [po]ssesses a most superficial knowledge of the [art] which is here discussed. We think that [suf]ficient has been quoted to substantiate such [an] assertion; but, should any latent doubts of [our] grounds for the charge still exist, the fol[lo]wing sentence will at once dispel them. The [re]viewer is indulging in a lofty strain of high-[flo]wn verbiage about the sensitiveness of the [col]lodion film (at which the sun is elegantly [sai]d merely to "wink his eye"), and then we [ar]e told—

"Further than this, the powers of photography can [ne]ver go; they are already more nimble than we [ne]ed (!) Light is made to pourtray with a celerity [on]ly second to that with which it travels (!!); it has [be]en difficult to contrive the machinery of the [ca]mera to keep pace with it (!!!), and collodion has [to] be weakened in order to clog its wheels (!!!!)."

We are weary of wading through such non[se]nse—let us turn to the part which, doubtless, [wi]ll repay us for reading. Surely an artist can [w]rite sense on his own subject, if he is out of his depth in science. It is ushered in by a flowery description of some of the defects of photography. When speaking of the inability of the sensitive surface to represent the effect of colour, we read—

"So impatient have been the blues and violets to perform their task upon the recipient plate, that the very substance of the colour has been lost and dissolved in the solar presence."

And again—

"Even if the world we inhabit were constituted but of two colours—black and white, and all their intermediate grades * * * * photography could still not copy them correctly. Nature, we must remember, is not made up of actual lights and shadows; besides these more elementary masses, she possesses innumerable reflected lights and half tones, which play around every object, rounding the hardest edges, and illuminating the blackest breadths, and making that sunshine in a shady place, which it is the delight of the practised painter to render. But of all these photography gives comparatively no account. The beau ideal of a Turner and the delight of a Rubens are *caviar* to her. Her strong shadows swallow up all timid lights within them, as her blazing lights obliterate all intrusive half-tones across them; and thus strong contrasts are produced, which, so far from being true to nature, it seems one of nature's most beautiful provisions to prevent. * * * * * Every thing on which the light ***shines*** as well as every thing that is perfectly white, will photograph much faster than other objects, and thus disarrange the order of relation. When light meets light, the same instantaneous command seems to go forth as that by which it was first created, so that by the time the rest of the picture has fallen into position, what are called the high lights have so rioted in action as to be found far too prominent both in size and intensity."

We suspect that the weakening operation which the author was obliged to perform on his too sensitive collodion (see above), has been done with very impure samples of alcohol and ether, otherwise we cannot account for this statement. We trust that very few of our readers have such an infantine acquaintance with the subject as to be unable to obtain natural half-tints in their pictures, for, as far as we can unravel the author's meaning, that seems to be the disputed point.

We now approach a part of the subject respecting which we are less qualified to form an opinion. We confess to total ignorance of those conventional terms under which second-rate artists are wont to hide what appears to us a violation of nature's rules; but surely we are not in error when we fancy we detect a vein of quiet irony running through the following most amusing passage:—

"——— we sympathise cordially with Sir William Newton, who at one time created no little scandal in the Photographic Society by propounding the heresy that pictures taken slightly out of focus, that is with slightly uncertain and undefined forms, though less *chemically*, would be found more *artistically* beautiful. Much as photography is supposed to inspire its votaries with æsthetic instincts, this excellent artist could hardly have chosen an audience less fitted to endure such a proposition. As soon could an accountant admit the morality of a false balance, or a sempstress the neatness of a puckered seam, as your merely scientific photographer be made to comprehend the possible beauty of "a slight *burr*." His mind proud science never taught to

doubt the closest connection between cause and effect, and the suggestion that the worse photography could be, the better art was not only strange to him, but discordant. * * * * * * * * * * Sir William Newton, therefore, was fain to allay the storm by qualifying his meaning to the level of photographic toleration, knowing that, of all the delusions which possess the human breast, few are so intractable as those about art."

Surely the writer cannot mean that the high finish of the photograph is incompatible with that breadth of light and shadow which so pleases us in a good painting. To us it seems to be one of the glories of our art that it is doubly true to nature, not sacrificing the minute detail, and at the same time giving us all those grand Rembrandt masses of light and shade, which can only be seen in perfection amongst those scenes where it is the delight of the artistic photographer to wander.

If we make allowance for the soreness and jealousy with which the reviewer speaks of the connection of photography with art—(which perhaps is excusable, if we rightly understand the concluding paragraph in the essay, where it is lamented that "the higher professors of miniature painting have found their studios less thronged of late," and, "those who in future desire their exquisite productions will be more worthy of them")—with this allowance, the latter part of the review is not badly written; most of the photographs by inferior artists partake more or less of the defects which are here scattered with so unsparing a hand upon all; and, in fact, the following graphic description of the results of photographic portraiture will apply to, alas! too many of our cheap dabblers in the art.

"———— of all the surfaces a few inches square the sun looks upon, none offers more difficulty, artistically speaking, to the photographer than a smooth, blooming, clean washed and carefully combed human head. The high lights which gleam on this delicate epidermis so spread and magnify themselves, that all sharpness and nicety of modelling is obliterated—the fineness of skin peculiar to the under lip reflects so much light that, in spite of its deep colour, it presents a light projection instead of a dark one —the spectrum or intense point of light on the eye is magnified to a thing like a cataract. If the cheek be very brilliant in colour, it is often as not represented by a dark stain. If the eye be blue, it turns out as colourless as water; if the hair be golden or red, it looks as if it had been dyed; if very glossy, it is cut up into lines of light as big as ropes. This is what a fair young girl has to expect from the tender mercies of photography."

But the unerring truth of photography has made some impression upon the reviewer. Towards the conclusion he relents somewhat, and makes many admissions, which we certainly did not anticipate when the hopeless inability of photography to copy anything correctly was so lucidly proved, or rather so positively asserted, in a former part. We now read that photography

"is made for the present age, in which the desire for *art* resides in a small minority, but the craving * * * for *correct facts* in the public at large."

Lest our readers should hesitate in accepting the admission conveyed in the above antithesis, we give them the following extracts:—

"Minute light and shade, cognisant to the eye, but unattainable by hand, is its greatest and eas triumph."

"What are her unerring records, but facts of most sterling and stubborn kind."

"What are her studies of the various stages insanity—pictures of life unsurpassable in path truth—but facts as well as lessons of the dee physiological interest."

Ample justice is *here* done to the wonde resources which science has placed at the posal of every one, be he artist or not. But fr the general tone of the article we are justi in complaining that imperfections, only pres when the powers of photography are wielded unskilful hands, are considered as radical fa in the machinery, and the art judged by v imperfect and false specimens of its true pow It is most presumptuous and unjust for any however perfect his artistic knowledge, attempt to institute comparisons between own peculiar study and any other art, the su ficial knowledge of which has evidently b got up for the occasion. We are truly pai to see an article like that which we have b discussing, in the pages of one of our liter organs of such sterling reputation for accur and discriminating judgment—one which upwards of half a century has been ador with contributions from men whom we ju honour as mighty chieftains and generals that great intellectual army, whose onward gress the fiercest thunder of the cannon powerless to stay.

Liverpool Photographic Society. — ' next meeting of the Liverpool Photogra Society will be held on Tuesday, the 19th i As it is probable this will be the last meet for the season, a full attendance of member specially desirable.

LONDON PHOTOGRAPHIC SOCIET

This society held its third ordinary meeting Thursday, the 7th instant; Sir W. J. New vice-president, in the chair.

The minutes of the former meeting were r and confirmed.

The Chairman read the following letter f Dr. Diamond, referring to the decease of Frederick Scott Archer:—

To the President of the Photographic Society

My Lord,—I regret that I should be preve remaining in London to-night, to attend the mee of the society; but I hope it may not be against rule to ask for the society's sympathy for the wi and family of the late Frederick Scott Archer, it may lend its aid and cordially assist in urging t claims on the public which have not been en acknowledged during the lifetime of this grea vancer of photography. Very recently he had engaged in experiments likely to lead to further provements, but ill health disabled his proceed nor can it be denied, I fear, but that feelings of appointment, while reflecting on those he left b unprovided for, saddened his last sickness.

Hoping that the society's voice may prove communication to have been unnecessary, and much respect, I have the honour to remain, my l yours faithfully, J. R. DIAMOND, M.

Haydon Hall, Eastcote, 7th May, 1857.

Mr. Mayall then rose and said that he been in intimate communication with the

d during a great portion of his illness, and aken his farewell only a few hours before leath. He was also empowered by the w to read a portion of a letter which she sent to the speaker upon the subject. After further observations in which the dis-y of Mr. Archer was spoken of in the est terms, the following extract from Mrs. er's letter was read :—

'o-morrow there will be a meeting of the Pho-phic Society; in the morning we shall consign ear husband to the grave in Kensall Green. I ot know if you will think fit to allude to this nstance in the evening; you might add that f and children are left totally unprovided for, have not the slighest doubt that this feeling ened Mr. Archer's life. His health failing, he not help regretting the time he had spent in experiments, instead of making exertions to le for the wants of his family."

speaker then urged that a subscription d at once be commenced, and stated that ould give twenty guineas at once; and as as at present in communication with the ipal photographers in all parts of the world, ggested that, with a properly organized nittee, there would soon be sufficient col-l to place Mrs. Archer and her children d the reach of want.—(Loud cheers.)

er some further remarks it was agreed mously that Messrs. Mayall, Heath, and on should be the working committee, with r to add to their number; and as a pre-ary step the council were recommended to the subscription list, which was then going the room, with the sum of £50 from the of the society.

fessor MACDONALD, of St. Andrew's, then ited and explained a new Sliding Table for oscopic Cameras, of which the following is ription :—

e principal alteration which has been made e stereoscopic camera and accompanying atus, which is suggested as an improve-consists in the form of the table on which mera is placed. The table is fixed on the stand, and either screwed to the brass or on the flat ledged table sometimes having the side ledges notched, so as to the sliding table of the camera. In order ure parallelism, the table, which is 1 foot gth, 6 inches broad, and made of mahogany ns of an inch thick, having a cross piece d firmly across each end, to prevent warp-om the heat; has on the upper margin front and back edges a piece of wood screwed down, ½ inch broad, about 5-16ths but leaving a groove for the supporting to slide along, securing steadiness and elism by the pressure of a spring on the ior edge of the block.

idistant from the centre of the table, there e holes on each outer portion of the table, s of an inch; in these there are fitted small en pins, for the purpose of checking the g block, at the same distance from the e of the table, by a peg or pin.

e sliding block, 4½ inches square, is re-l in its place, the edges being in the es formed by the marginal pieces im-ed on the table. Near the anterior part of the block there is a brass screwed peg rising up-wards, on which the camera turns. This is kept in its place by a brass nut in the cavity of the camera. At the posterior angles of the sliding block there is embedded a small brass plate, through the upright part of which the regula-ting screws act, thus securing the angle at which the camera is placed when taking a picture.

The camera has a plate, with a projection behind, which the regulating screws act on, so that, as soon as the corresponding centres of the pictures on the ground glass has been ascer-tained, the regulators secure the correctness of the motion of the camera.

This table may be used for any common form of stereoscopic camera. The one at present is of an early form. I have another, where the slide is very much shorter and simpler, and where the focusing glass is separate, thus allow-ing the plate to be prepared while focusing, giving some rapidity to the process when taking portraits, and thereby diminishing the exhaus-tion of the sitter.

Mr. SHADBOLT then opened the discussion of the evening, (the stereoscope,) by stating that the distance of the picture from the eye of the observer in the stereoscope had been alto-gether left out of consideration, yet it was one of the most important points that had to be taken into consideration, when arranging the camera. Great difference of opinion was also stated to exist as to the points of view from which a picture should be taken. Many gentle-men were not satisfied with anything but an exaggeration of the natural distance, because, they said, "it made the object *stand out better*." Stand out better than what? than nature? It was quite clear to those who understood any-thing, practically, of the subject, that the sole effect produced by keeping the cameras wider apart than the eyes, is a representation which increases the distance between the fore and background of the picture. The speaker then described some faults, which he stated were found in all refracting sterescopes, being greater when lenses of large lateral refractive power were used, and only entirely absent in the Wheat-stone's first reflecting stereoscope. Messrs. Negretti and Zambra were stated to have brought out some new stereseopes which were very free from the ordinary faults of the small instruments. After some other observations, the speaker concluded by saying that if the stereoscope slightly converged the axes of the eyes it gave the idea of the picture being at a very moderate distance off, but if it compelled us to look nearly parallel it gave the impression that the object was at a greater distance.

Mr. LONG made some observations upon the parallelism of the cameras, and stated that he fully agreed with Mr. Shadbolt that the two positions of the camera should not be more than 2½ inches apart.

Mr. SHADBOLT then alluded to some new ste-reoscopes which were upon the table, the inven-tion of Mr. Scott, of Dundee, who had taken out a patent for them; the peculiarity consisted in the use of entire lenses instead of parts, and they were so placed that the distance between them was a trifle more than the average distance be-

tween the eyes. the object being to suit all sights. If they were the exact distance, then persons whose eyes are a little wider apart would see the pictures through the wrong side of the centre of the lenses.

Mr. MALONE rose, and stated that he had been informed by MM. Ferrier and Soulier, who are the makers of the transparent slides generally on sale in this country, that they placed their cameras wide apart in taking views, and quite ignore the proceeding of only placing them the distance of the eyes. One well-known view of Paris was taken from the top of a tower of Notre Dame, and with the cameras separated more than fifteen yards. Those who spoke of limiting the distance apart to two and a-half inches, did not understand the subject. It might accord with some use of their own, to which they were putting the instrument, but it was not making it fulfil the inventor's object. If a picture were taken from the top of the tower of Notre Dame with the cameras placed only two and a-half inches apart, the result was not the solid representation which was wanted; people might call the other a "model," but the speaker contended that it was a model that was wanted. If the cameras were placed the two and a-half inches apart, and a near object were copied, it would be evident at once that it would be viewed under a considerable angle, and so far they were fulfilling the rule of the inventor; they were taking a true stereoscopic picture. But as the distance between the object and the camera increased, the *angle* was lessened, and to keep the proper angle the cameras must of necessity be moved wider apart. In copying a statue, unless this were done the appearance would be that of a *bas-relief*, and not of a solid body. In natural scenes there were objects at all distances, and then the amount of separation of the cameras was a matter requiring great judgment; no general rule could be laid down, it depended upon the object in the view which was wanted to appear in the solid form. If in the same picture both near and distant objects were wanted to appear solid, and without distortion, it was asking for an impossibility; a compromise must be made between the two.

Professor MACDONALD said that a mistake arose in consequence of the whole stereoscopic effect being supposed to be produced in the cameras. The cameras were only the means for obtaining that object, but the true effect was produced through the two eyes, in the brain. Upon holding up one finger near the eyes, and another at a little distance off, when the near finger was looked at, the image of it fell upon the centre of the retina in each eye, where alone was the seat of perfect vision, and the images of the more distant finger fell inside that point on each retina, and thus were only seen indistinct. When the distant finger was the one looked at, the contrary effect took place.

Some slight discussion here took place between Mr. MALONE and Mr. SHADBOLT, respecting the proper meaning of some of the terms used. The latter gentleman then asked Mr. Negretti to state a difficulty which he had encountered when about publishing some views.

Mr. NEGRETTI rose and said that Mr. Frith and Mr. Wenham, who were now in Nu[illegible] taken and sent home at a great expense [illegible] hundred beautiful stereoscopic views. [illegible] could only be published upon paper, bec[illegible] they were published, as they ought to [illegible] glass transparencies, they would instantl[illegible] negatives copied from them, and thu[illegible] prints published at a less price than the[illegible] afford to sell them.

After some few remarks about the [illegible] copyright, as applied to photography, [illegible]

Mr. CROOKES exhibited specimens of [illegible] photographs which had been treated on [illegible] with sulphuric acid (in the manner desc[illegible] No. 8, p. 75, of the *Liverpool and Ma[illegible] Photographic Journal.*) The increased [illegible] and brilliancy thereby acquired were ver[illegible] rent, as was also the contraction and ha[illegible] face, the latter being illustrated by rubb[illegible] picture with a wet cloth, which com[illegible] rubbed away the part unacted on, but [illegible] the slightest effect upon the altered [illegible] Several questions were asked respecti[illegible] properties of the pictures so treated. [illegible] cretary stated that he had tried pictures [illegible] fixed, and toned in every way that he k[illegible] and in no single instance were the h[illegible] injured, or the appearance of the pictu[illegible] riorated; in fact, the contrary effect was t[illegible]

The meeting then adjourned.

The subscriptions collected in the room [illegible] the meeting in aid of the widow and f[illegible] the late Mr. Archer, amounted to upwards [illegible]

DEATH OF MR. FREDERICK SCOTT AR[CHER]. The papers record the death of Mr. F[illegible] Scott Archer, of Great Russell-street, [illegible] ventor of the collodion process in phot[illegible] which has worked such wonders. A fri[illegible] in a note which is now before us, "On [illegible] of September, 1850, he communicated t[illegible] views, and brought the *collodion* and el[illegible] *all* of his own make, and I, with them, [illegible] first collodion picture. The following [illegible] published the process in the *Chemist*, b[illegible] the months previously he told the [illegible] some of his friends, who assumed to th[illegible] more or less of undue credit." To ev[illegible] his due!—*Athenæum.*

MANCHESTER ART TREASURES EXHI[BIT]ION. Photography will, at this exhibition, pr[illegible] its a most efficient auxiliary to art, and [illegible] will applied most extensively as a mean[illegible] petuating and giving publicity to ma[illegible] of t[illegible] treasures which the building contai[illegible] T[illegible] executive committee have instructed [illegible]. De[illegible] motte to take a large number of st[illegible] scop[illegible] and photographic views of different [illegible] ions the Exhibition, which are to be permi[illegible] d to sold in the building, at a scale of pri[illegible] wh[illegible] will place them within the reach of the [illegible] visitor. Messrs. Agnew & Sons, of Ma[nc]hest[illegible] in conjunction with Messrs. Colnaghi, [illegible] noun[illegible] the publication of a series of large pho[to]graph[illegible] views of the building and its contents. Messr[illegible] Caldesi and Montecchi are constantl[illegible] t wo[illegible] with their cameras in taking copies of [illegible] works of art, for a grand publication b[illegible] Mess[illegible] Colnaghi. Messrs. Day & Son have ar[ran]ged [illegible] the publication of a magnificent work [illegible] olour[illegible]

in their unapproachable style, corresponding in character with "the Industrial Arts of the Nineteenth Century," with copious text and description of the engravings. Photographs will be the basis of the coloured engravings, and this work may be said to commence where the photographer ceases. Correctness of outline will be secured by the camera, and accuracy of colour by the pencil of the artist.—*Observer.*

DUBLIN PHOTOGRAPHIC SOCIETY.

At the meeting of the above society, held on the 1st April, 1857, Mr. T. Shaw Smith read a paper detailing his modifications of the calotype or wet paper process, of which the following is an abstract:—

The modifications of the wet paper process by which I have been enabled with great certainty to obtain negatives of excellent quality in Eastern climes, and during temperatures ranging between 70° and 90° in the shade, are three in number,—the apparatus required in each case being of the simplest description, and 1 oz. of distilled water serving to sensitize and develop four pictures of 9 × 7 inches.

For the lowest temperatures I used Whatman's paper, iodized as usual, and excited with aceto-nitrate, 20 grains of nitrate, and 1½ drachm acetic acid per ounce—time of exposure about five minutes.

For temperatures from 70° to 85° I used Canson's paper, cut to the size required, leaving two short slips at two opposite angles to handle by, and iodized as follows:—

Two lumps of Russian isinglass were dissolved in 17 ozs. distilled water, filtered through muslin, and 13 grs. of iodide of potassium added to each ounce, and 1 gr. solid iodine. The papers were immersed in this, using the ordinary precautions against air-bubbles, &c., the fluid being kept warm by an outer dish of hot water. The papers on removal were drained and hung up to dry by one corner. The exciting bath for these was a 35-grain one.

When the temperature rose above 85° these papers would not keep during the day—they became spotted. This difficulty I overcame as follows:—An iodizing bath was prepared similar to the last-mentioned, only leaving out the solid iodine and substituting as follows:—

Four drops of "bromure d'iode" were added to the bath, and eight papers, of say 9 × 7, were then iodized; then, if more papers were to be iodized, 4 more drops of the last solution were added, and so on, adding 4 drops of the "bromure d'iode" for each eight papers iodized.

The effect of this addition of the "bromure," while it nearly doubled the required time of exposure in the camera, was, to cause the papers so prepared to keep well during the whole day under the highest temperatures, the papers being excited in the morning and developed the same evening. The exciting bath was a 35-grain one.

My method of manipulating in exciting and developing is as follows:—

The glasses of the châssis being removable, on one of these, roughly levelled, is filtered a sufficient quantity of the exciting fluid, which is spread with a slip of paper; on this is laid the sheet to be sensitized; as soon as the purple tinge has disappeared, the surplus fluid is drained back into the bottle, and a sheet of common paper, wetted with distilled water, laid over; the two sheets are then pressed together, and the surplus liquid removed by drawing over them the edge of a glass ruler.

A second iodized sheet being similarly prepared on the second glass of the châssis, and the whole put together, the papers retain their moistness, sensitiveness, and keeping qualities during the entire day. The time of exposure for the papers prepared with the "bromure d'iode" I found to be about seven minutes in sunlight, using ¾-inch aperture with 14-inch focus.

In developing, I partly raise the negative by one of the elongated corners, pour on the plate, near the centre, a saturated solution of gallic acid, and distribute it by raising the corners of the negative in succession. The development usually occupies about five minutes.

The only novel thing in these processes is perhaps the use of the "bromure d'iode" in combination with the iodide of potassium, which appears to have the valuable property of rendering the sensitive papers available during the whole of the hottest day.

ON THE CHEMICAL COMPOSITION OF THE PHOTOGRAPHIC IMAGE.

By T. F. Hardwich, Esq.

The determination of the chemical nature of the photographic image, in its various forms, is a point of much importance, both as indicating the conditions required for the preservation of works of art of that class, and also as a guide to the experimenter in selecting bodies likely to have an effect as chemical agents in photography.

It has been stated by some who have given attention to the subject, that the image is formed in all cases of pure metallic silver, and that any observable variations in its colour and properties, are due to a difference in the molecular arrangement of the particles. But this hypothesis, although involving much that is correct, yet does not contain the whole truth, for it is evident that the chemical properties of photographic image often bear no resemblance to those of a metal. One photograph may also differ essentially from another, so that we are led to infer the existence of two varieties, the first of which is less of a metallic nature than the second.

In investigating the subject, the principal point appeared to be to examine the action of light upon chloride of silver, and afterwards to associate the chloride with organic matter in order to imitate the conditions under which photographs are obtained.

The following is an epitome of the conclusions arrived at:—

Action of Light upon Chloride of Silver.—The process is accompanied by a separation of chlorine, but its product is not a mere mixture of chloride of silver and metallic silver; if it were so, we cannot suppose that the darkening would take place beneath the surface of nitric acid, which it is found to do. A definite subchloride of silver seems to be formed, the most important property of which is its decomposition by fixing agents, such as ammonia, and hyposulphite of

soda, both of which destroy the violet colour, dissolving out protochloride of silver, and leaving a small quantity of a grey residue of metallic silver.

Inasmuch, therefore, as all photographic pictures require fixing, we may conclude that if they could be produced upon pure and isolated chloride of silver, (which, however, is not the case,) they would consist solely of metallic silver.

Decomposition of Organic Salts of Silver by Light. — Compounds of oxide of silver with organic bodies, are as a rule darkened by exposure to light, but the progress does not always consist in a simple reduction of the metallic state. This assertion is proved by the employment of the following tests :—

a. *Mercury.*—Little or no amalgamation takes place on triturating the darkened salt with this metal.

b. *Ammonia and Fixing Agents.*—These usually produce only a limited amount of action. Thus, the albuminate of protoxide of silver is perfectly soluble in ammonia; but after having been reddened by exposure to light, it is little or not at all affected.

c. *Potash.* — Animal matters coadjulated by nitrate of silver, and reduced by the sun's rays, are dissolved by boiling potash, the solution being clear and of a blood-red colour. Metallic silver, it is presumed, if present, would remain insoluble.

d. *Boiling Water.*—Gelatine treated with nitrate of silver and exposed to light, loses its characteristic property of dissolving in hot water. This experiment is conclusive.

The above facts justify us in supposing the existence of combinations of organic matter with a low oxide of silver; and analysis indicates further that the relative proportion of each constituent in these compounds may vary. For instance, when citrate of silver is reduced by light, and acted on with ammonia, a black powder remains, which was found to contain as much as 95 per cent. real silver; but albuminate of silver treated in the same way yields on analysis less of metallic silver, and more volatile and carbonaceous matter.

The use of *ammonio*-nitrate of silver in preparing the salt tends also to increase the relative quantity of metal left in the compound after reduction and fixing. The length of time during which the light has acted, has also a modifying effect of the same kind,—the product of reduction by a powerful light being more nearly in the state of metal, and containing less both of oxygen and organic matter.

Action of Light upon Chloride of Silver associated with organic matter.—Photographs formed on chloride of silver alone, would, after fixing, consist of metallic silver, but such a process could not be carried out in practice. The addition of organic matter is absolutely necessary in order to increase the sensitiveness, and to prevent the image from being dissolved in the bath of hyposulphite of soda. The blue subchloride of silver is decomposed by fixing, a very scanty proportion of grey metallic silver remaining insoluble; but the red compound of suboxide of silver with organic matter is almost unaffected by hyposulphite of soda or ammonia.

The increase of sensitiveness and intensity produced by the use of organic matter is accompanied also by a change in the composition of the picture; the image losing the metallic character which it possesses when formed on pure chloride of silver, and resembling in every respect the product of the action of light upon organic salts of silver.

There are certain characteristic tests which may usefully be employed in distinguishing the metallic image from what may be termed the organic or non-metallic image. One of these tests is cyanide of potassium. An image formed upon pure chloride of silver, although pale and feeble, may, after fixing, be immersed in dilute solution of cyanide of potassium without injury. But a photagraph on chloride of silver supported by an organic basis, is much acted upon by cyanide of potassium, quickly losing its finer details.

A second test is the hydrosulphate of ammonia. If no organic matter be employed, the image becomes darker and more intense by treatment with a soluble sulphuret; whilst the non-metallic image, formed on an organic surface, is quickly bleached and faded. The action of sulphur upon the image is indeed a mode of determining the real quantity of silver present. When existing in a very finely divided layer, sulphuret of silver often appears yellow : but in a thicker layer it is black. Hence the colour of the photograph, after treatment with sulphuretted hydrogen, is an indication of the proportion of metal present, and the reason of the organic image becoming so perfectly faded is because it contains a minimum of silver in relation to the intensity. We see, therefore, that the addition of organic matter to chloride of silver does not so much increase the actual quantity of silver reduced by light, as it adds to its opacity by associating other elements with the silver, and altogether modifying the composition of the image.

The employment of *oxidizing agents* shows also that in an ordinary photographic process by the direct action of light, other elements besides silver assist in forming the image : the pictures being found to be easily susceptible of oxidation, whereas the metallic image formed on pure chloride of silver resists oxidation.

Composition of DEVELOPED *images.*—By exposing sensitive layers of the iodide, the bromide, and the chloride of silver to the light for a short time only, and subsequently developing with gallic acid, pyrogallic acid, and the protosalts of iron, a variety of images may be obtained, which differ from each other materially in every important particular, and a comparison of which assists the determination of the disputed point.

The appearance and properties of the developed photograph are found to vary with the existence of the following conditions.

1st. *The surface used to sustain the sensitive layer.*—There is a peculiarity in the image formed on *collodion.* Collodion contains pyroxyline, a substance which behaves towards the salts of silver in a manner different from that of most organic bodies, exhibiting no tendency to assist their reduction by light. Hence chloride of silver on collodion darkens far more slowly than the same salt upon albumen, and the image, after fixing, is feeble and metallic. Iodide of silver

collodion, exposed and developed, gives usually more metallic image, with less intensity, than ide of silver upon albumen, or on paper sized h gelatine. By adding to the collodion a body ich has an affinity for low oxides of silver, h for instance as glycyrrhizine, the opacity of developed image is increased.

2nd. *The nature of the sensitive salt.*—When *ide* of silver is used to receive the latent impression, the image after development, although king intensity of colour by reflected light, is re nearly in the condition of metallic silver n if bromide or chloride of silver be substituted; and of the three salts, the chloride gives most intensity, with the least quantity of tallic silver. This rule applies especially when ganic matters, gelatine, glycyrrhizine, &c., are sent.

3rd. *The developing agent employed.*—An ornic developing agent like pyrogallic acid may expected to produce a collodion image more ense, but less metallic, than an inorganic developer, such as the protosulphate of iron.

4th. *The length of time during which the light acted.*—Over-action of the light favours the duction of an image which is dark by reflecn and brown or red by transmission, correonding in these particulars to what may be med the non-metallic image containing an de of silver.

5th. *The stage of the development.*—The red ige first formed on the application of the deoper to a gelatinized or albuminized surface odide of silver is less metallic, and more easily ured by destructive tests, than the black image, ich is the result of prolonging the action. veloped photographs which are of a bright red our after fixing, correspond in properties to iges obtained by the direct action of light on per prepared with chloride of silver, more rly than to collodion, or even to fully deveed Talbotype negatives.

To conclude the paper, the following may be ered in the way of recapitulation:—An image isisting of metallic silver, as a rule, reflects ite light, and shows as a positive when laid black velvet; but a non-metallic organic age is dark, and represents the shadows of a ture. Collodion positives developed with tosalts of iron are nearly or quite metallic. otographs on albumen or gelatine less so than se on collodion. Developed photographs tain more silver than others, if the developnt has been prolonged. The half shadows of image in a positive print are especially liable suffer under injurious conditions, since they tain the silver in a less perfect state of reducn.—*Photographic Chemistry, Fourth Edition.*

We quote the following letter *in extenso* from *Athenæum*, as it contains some good and ful suggestions. The idea of the band-lens, wever, is not new, as we employed it at the dcliffe Observatory nearly three years ago. cannot either allow the stereoscope to be so tirely given to Sir D. Brewster as is here done; first time Sir David's name appears, it evintly is an error for Professor Wheatstone's:—

"*Edinburgh.*

'As a photographic process, styled the 'Hallope,' is now attracting public curiosity for its alleged stereoscopic effect, or approach to it, will you allow me in your columns to call attention to some other processes, by which such results may be, I believe, obtained in a much more perfect and convenient way. I have not, I confess, seen the 'Hallotypes,' and cannot, therefore, criticise their effect, but the contrivance does seem to me a rather clumsy and unscientific one. As far as I can discover, the pictures placed above one another are not over originally stereoscopic ones to begin with. The plans which I have proposed for obtaining an approach to stereoscopic effect are the following:—1. The printing of one positive from a pair of stereoscopic glass or paper negatives, placed the one above the other, or the printing from a negative which has been in the first instance itself printed from two stereoscopic positives, placed one above the other, all this being done in the pressure frame. 2. The taking in the camera of a single negative from two stereoscopic positives at once by an arrangement which will unite the two into one. This is accomplished by using a lens with the whole of its outer surface covered by a close-fitting cap, with the exception of two eye-holes, which are left at a convenient distance in a horizontal line. The combined picture may be softened down by a pencil, with or without colours; or we might, if wished, combine more than two into one by using more pictures and more eye-holes, or a separate lens with the axes suitably adjusted. 3. We may take our negative from Nature direct in the ordinary way, but with our lens blocked up, as in our last, with the exception of the two circular openings which represent our two eyes, and which give us, in our resulting negative, precisely the two pictures which would be seen by our two eyes combined into one picture. But as, though combined in a certain sense, they are not absolutely connected, except in one point, a little softening down may be desired, which may be effected either in the positive or in the negative, as wished. 4. We may work with a lens having its top and bottom portions blocked up in front, so as to prevent any of the rays from our object falling on them; the light being thus admitted only to a narrow horizontal band across it. By this we get the same two pictures as we do by the last arrangement from the two extremities of our horizontal belt; while the space between these extremities, by an infinite number and variety of intermediate pictures which it yields, serves to shade the two extreme ones imperceptibly into one. This last process is what I would recommend; and though we may not get by it what I at first expected when I began to devote attention to the subject, namely, that perfect solidity which Sir David Brewster has now most beautifully shown to be produced, and only producible by the successive convergences of the optic axes on different points, we will yet obtain a picture which is a much better compromise with visible Nature, as seen by a two-eyed animal, than any which ordinary one-picture photography can produce, and which may be, also, of no small use to the painter and other artists who profess to represent visibly Nature as on a flat surface, in showing them how much and what part of Nature they ought to aim at giving us. The two latter plans I communicated to the Edinburgh Photographic Society, in a paper read before it on the 10th of February, this year; but as they have not yet been brought fully out in the literary organ of that society, I would be much obliged by your giving photographers in general an earlier opportunity of comparing them with the new 'Hallotype' process. Sir David Brewster's eye lenses will, no doubt, give us a much more perfect picture than our belt or band-lens, and a picture most valuable as a mathematical projection, and for many purposes; but then it is not the picture which we do see in Nature, and which we therefore look for

in Art. Rather give us, for general purposes, a tolerable approximation to what we do see, than the best possible representation of what we do not see. The common lens gives pictures which err by redundancy; Sir D. Brewster's eye-lens pictures, which, though the most exquisitely perfect things in the world, are not just what we are looking for, and our band-lens a picture which, though only a compromise picture, as we have already stated, will yet, we think, prove more satisfactory than either to non-Cyclopean 'ungouged' humanity. The band-lens will also have the advantage in rapidity over the one-eyed lens of the same width, or we may reduce the breadth farther without making it unworkably slow in its operation. Should any one be anxious to get a picture of Nature in an out-of-the-way aspect, he has only to turn the lens till the belt is upright instead of horizontal, when he will get a picture of the same class which he sees in looking at Nature with his head lying on one side.

I am, &c., C. J. Burnett.

P.S.—I do not know whether any one has been before me or not in an experiment as to the taking of photographs from the images produced by the kaleidoscope. The results might be convenient for reference to our art-manufacturers. We require for this purpose a suitable lens before the plates of the kaleidoscope. As to the system of band-lens, which I recommend, its application might, of course, be extended to miscroscopic photography and to other purposes.

CONTRIBUTIONS TO THE THEORY OF THE STEREOSCOPE.

By William Crookes.

The great stumbling-block appears to be, that what is wanted, namely, a truthful image of nature, can of necessity be only obtained by strict adherence to the $2\frac{1}{2}$ inches which Nature has chosen for the width between the eyes. Now, however perfect our senses are, there is always an insatiable craving towards improvement: we cannot, it is true, increase the diameters and focal lengths of our eyes respectively to 10 inches and 12 feet; neither would it be quite convenient to widen their lateral separation 30 or 40 times; but the ingenuity of our philosophers has shown us how these same ends may be effected by the use of the strictly parallel instruments, the telescope and stereoscope.

Let us compare the two. Supposing we wish to see a castle which is ten miles from us, as it would be were it only a quarter of a mile off, we apply such a power to the telescope that the object shall be magnified 40 diameters, and the desired result is at once obtained. But now, not content with seeing merely the height and breadth magnified (the x and y of the mathematicians), we wish to see the depth also (the z) increased; the buttresses and towers must have their proper truthful relief, as they would really appear to an observer only a quarter of a mile distant: we therefore separate the two points of sight (the two positions of the camera), 40 times, *i. e.* upwards of eight feet apart, and the result must be, for that particular object, pure undistorted truth; of course, just as, in the first example, objects in the foreground cannot be absolutely in focus at the same time as is the more distant castle, just so will objects in the foreground of the stereoscopic image appear with exaggerated depth.

One word respecting the effect of the parallelism of the cameras on the resultant image. If we wish to copy an object only a few feet distant, the most obvious thing that would first be done, would be to point the cameras inward so that the prolongation of the axes of the two lenses would meet at the object: more careful consideration would, however, show that the convergence of these two axes must of necessity produce certain results in the ultimate image, which might be avoided by keeping them parallel: the position of the two finished pictures in the stereoscope should be inclined to each other, as were the two sensitive plates in the cameras, and must only be mounted on the same flat surface when the cameras were originally placed parallel, or distortion will of necessity be the result. There is another effect produced by the same cause, which in many pictures is as painful to the eye as the most exaggerated relief; it is this: in the usual way of mounting stereoscopic pictures, especially transparent ones, the mount is so made as to form a frame in which the object is seen. When the two cameras are parallel, the principal object cannot be in the centre of both plates at the same time: it will be displaced laterally towards the right in the picture intended for the right eye, and to the left in that for the left one; and a little consideration will show that the result of this will be, that the image seen in the stereoscope will appear as if it were projected *behind* the frame. With converging cameras, however, the effect is different: the phantom image will be projected *in front* of the frame, producing an appearance of unreality, painful to the eye as it is antagonistic to the effect intended to be produced.

PORTABLE TENT FOR OUTDOOR WORK.

By H. Fitzgerald, Esq.

The following is an account of the tent I have invented for photographic purposes. I believe it will weigh about ten pounds—perhaps with the shot eleven pounds; it is 7 feet high, by [illegible] feet in diameter. It is made of black calico, lined with yellow. At the bottom is a loose black curtain one foot deep, which is to lie on the ground and help to exclude the light. Into the interior of the tent are sewn four india-rubber air-tubes, sufficiently large, when inflated, to keep the calico fixed in a circular form. The four air-tubes are connected by eight small ones, so that, on the application of a small india-rubber bellows to a nozzle fitted on to the second air-tube, the whole four tubes are simultaneously inflated. This operation having been performed, the photographer takes the cord which is attached to the ring at the top of the tent (at the end of which cord is a bullet), and throws the bullet over any branch of a tree which he may have previously selected as being convenient for his intended operations. He then draws the cord over the branch until he has raised the tent to its proper height, and fastens it round a tent-peg previously driven into the ground. The tent being thus simply erected, I will now explain the means of ingress and egress, which are equally simple:—A number of small brass rings are sewn into the interior of the tent in rows extending from the

p to the bottom; these rows being eight in umber, and placed at an equal distance from ch other. Through each of these rows a nall cord passes, which is to be made fast at e bottom of the tent. At the top of the tent ese eight cords unite, and, after passing rough a ring similar to that on the top, are rmed into one cord, by drawing which the iotographer raises his tent in folds from the ound exactly as if it were a Venetian blind. he photographer, having raised the tent to a ifficient height, fastens the cord to a tent-peg iven into the ground in the interior, and pro-eds to take the picture. During his absence ie tent gets thoroughly cool and filled with esh air; and on his return to develope the cture he lets it down over him again until the ork is done. When the tent is required to be iken down, the nozzle is unscrewed, the air nmediately escapes, the tent collapses, the illet is thrown back again over the branch of ie tree, and the whole will now go into a small irpet bag. It seems to me that this tent is ghter than others, simple in action, and, from s having no doors, will effectually exclude all ght but that which is allowed to enter through ie yellow window. If it is found to be an nprovement on those hitherto in use, I shall el gratified at having done something, how-ver small, for practical photography.

HE PREPARATION OF PYROGALLIC ACID.

By Professor Liebig.

HE author has already called attention to the dvantages of the employment of pyrogallic cid in photography; it has since almost entirely aken the place of gallic acid. He now gives a rocess for its preparation, which he regards as he most advantageous, and which he has em-loyed for the last three years.

The material required is crystallized gallic cid; when decomposed by heat, it furnishes he most beautiful pyrogallic acid in very large uantity. There is no saving in the employ-nent of dried gall-nuts or their dry extract.

For this purpose the gallic acid is strongly lried, mixed with twice its weight of coarsely owdered pumice-stone, and exposed to its emperature of decomposition in a current of arbonic acid. The mixture of gallic acid and umice-stone is put into a tubulated retort, of which it does not fill more than one-fourth; the retort is placed in a sand-bath, and surrounded with sand nearly up to its tubulure. A glass tube is inserted into the tubulure, through an india-rubber tube, and connected with an appa-ratus for the evolution of carbonic acid; the tube reaches deeply into the belly of the retort, so that its opening is about a quarter of an inch from the mixture.

The neck of the retort, which must be tolera-bly wide, reaches about eight inches beyond the margin of the sand-bath, and is loosely inserted into a corresponding receiver, so that the latter may be easily removed. The object of this arrangement is easily understood. Dry gallic acid is decomposed at a high temperature into pyrogallic acid, metagallic or melanogallic acid, carbonic acid and water; the author has sup-posed that from two atoms of gallic acid, $C^{28} H^{12} O^{20}$, there are formed two atoms of pyrogallic acid and one atom of metagallic acid, $C^{12} H^{4} O^{4}$, with elimination of four atoms of carbonic acid and two atoms of water, so that 100 parts of dry gallic acid should furnish 39 parts of pyrogallic acid. But as pyrogallic acid is decomposed into water and metagallic acid nearly at the same temperature at which gallic acid is decomposed, the procuring of 39 per cent. of pyrogallie acid depends essentially on the rapidity with which the acid is removed from the retort during its formation, and on the vapours being prevented from condensing in the upper part of the retort; for in this case it is impossible to avoid the fusion of the crystals and the flowing down of the fused pyrogallic acid into the belly of the retort in which it is decomposed. The current of carbonic acid serves to avoid this source of loss, but it also effects another object. In the current of gas the water formed retains its vaporous form at those places in the neck of the retort on which crystals of pyrogallic acid aro deposited; in the receiver, where vapours of pyrogallic acid and water condense simultaneously, a syrupous aqueous solution is obtained instead of the crystals; from this, pyrogallic acid may be pro-cured by evaporation, although never colourless.

It would be most advantageous to heat the gallic acid in a bath of *constant* temperature; this can never be attained by a sand-bath placed over a furnace, and the current of gas must therefore be regulated according to the tempera-ture. Thus if drops of fused pyrogallic acid are deposited in the upper part of the retort, the heat must be increased and the current of gas slackened.

When the decomposition is going on, the wide neck of the retort becomes filled very rapidly with long, broad, flat, shining white needles, which are removed with a feather. If the neck of the retort reaches the temperature of fusion of pyrogallic acid, it runs together, and solidifies lower down into a solid crust, which is removed with a silver spatula; during fusion the acid acquires a reddish colour, which persists after solidification and cannot be got rid of by char-coal. By this method, 31-32 per cent. of solid crystallized pyrogallic acid are obtained; the 7·8 per cent. which are lost according to the above calculation, give the carbonic acid evolved the appearance of a white smoke, and probably by a judicious arrangement of the apparatus some portion of it might be recovered.—*Chemical Gazette.*

A SIMPLE PLATE HOLDER.*

As the holder I am about to describe is merely a modification of that recommended by Mons. Brebisson in his "Nouvelle Méthode Photo-graphique," 1853, I lay no claim to originality. I have used them for over two years, and find them so useful, that I now take this method of making them known. They have at least this recommendation, that they are cheap, (their cost cannot well exceed sixpence,) and every one can make them for himself.

Take a strip of plate glass 3½ or 4 inches longer than the plate used, and from one-third to one-half of its width; rub down the edges and

* Communicated by "N" to the *Photographic Journal.*

cut off the sharp angles; then at 1 inch from each end fix on with marine glue, (having previously scratched with a diamond the surfaces of the parts that are to be united,) a strip of thinner glass half an inch wide and in length exactly the width of the larger strip; make, in fact, a glass dipper with a stop at each end, and a portion of the stem projecting beyond each stop. To use this holder, put on the centre of it a small piece of wet blotting paper or linen, and press the plate on it. It will adhere well, and even if it slides, when held perpendicularly, it is caught by the stop, and by holding it diagonally the collodion flows off the plate into the bottle without the slightest risk or difficulty. The plate being thicker than the stop, the collodion is not attracted off the edge, and every corner is covered. In developing, it is difficult to prevent the solution from running off the plate, but the space between the stop and the plate receives the liquid, and it runs off without soiling the fingers. The holder is, of course, held by that part which projects beyond the stop—the wider it is the less is the risk of the plate falling off, but greater skill is required to detach it. There is but one precaution to be observed in using it—it should be wiped after every development for fear of soiling the back of the next plate, and thus introducing pyrogallic acid into the nitrate bath.

CORRESPONDENCE.

☞ The Editorship of this *Journal* having changed hands, all letters to the Editor are in future to be addressed to Mr. T. A. Malone, London Institution, Finsbury Circus, London, E.C. Letters on the business of the *Journal* to be addressed, as before, to the Publisher, 16, Canning-place, Liverpool. Proper attention to these particulars will prevent inconvenience and delay.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Will you oblige me by giving the best formula for producing glass transparent slides by the collodio-albumen process of Mr. Neild?

I have succeeded very satisfactorily in obtaining ordinary negatives; but, when I try reprints on glass, as proposed in your Journal of the 15th March, the resulting positives are brown, and I cannot succeed in making them black enough. A. B.

Leamington, April 30th, 1857.

Sir,—Could you or any of your correspondents inform me respecting the dextrine syrup, used for preserving collodion? I want to know whether honey is superior to sugar for mixing with the dextrine; the proportion in which the gum and sugar should be mixed—whether the amount of dilution is important; and finally, whether the coating should be washed off, or merely wetted previous to developing.—I am, sir, yours obediently,

G. S. P.

Sir,—In reference to the annoyance complained of by Mr. Thompson in a previous number of the Journal, namely, the appearance of green or bright blue stains on his pictures—having been frequently troubled with the same things in the early part of my photographic career, but which are now of rare occurrence—perhaps you will allow me a word or two in your columns on the matter, which may be of use to your correspondent. The stains with me generally appeared at the lower edge of the plate, and I found them to arise from two causes: one, by allowing the collodion to touch the thumb whilst coating the plate; and the other by not sufficiently draining the plate after immersion in the silver bath; generally, however, this latter. I would recommend therefore, Mr. Thompson, after taking his plate out of the bath, to rear it up for at least one minute, to allow the superfluous silver to drain off into a piece of blotting paper placed under it, and in this manner to take off as much of the silver as possible, and also after exposure in the camera, and on arrival in the dark room for developing to take whatever drops of silver there may be off the lower edge of the plate with a piece of blotting-paper. The reason why the silver should be so effectually removed is very obvious, for wherever a portion of this liquid remains, that particular spot will develope sooner than another, and causes stains wherever it may have been left.—I am, sir, yours respectfully,

Sunderland, April 21st, 1857. E. GARDNER

ANSWERS TO CORRESPONDENTS.

F. H., Oxford.—A permanent increase in the size of this Journal to 20 pages is now adopted.

N. J. B.—1. We do not recommend the addition of accelerators to collodion. The best thing is to prepare it with chemicals of absolute purity. 2. Try the formulæ given in No. 5, p. 55, of this Journal 3. Try English paper, prepared in your bath of chloride, and excited with ammonio-nitrate of silver if you desire intense blacks.

Glasguensis.—There is nothing theoretically unsound in your developing solution, and as you get successful results, by all means keep to it. A nitrate of silver bath should be no more than *slightly* acid to get the best results.

X. A.—From four to five grains to the ounce of either iodide will give a film of sufficient density,

W. Mackison.—Received.

Dry.—Dr. Hill Norris has recently taken out a patent for the preparation of dry collodion plates We have doubts, however, about the validity of such a patent.

Old Col.—Your collodion bath will do for the waxed-paper process, if it is acidulated with the proper amount of acid.

CONTENTS. PAGE

A GREAT BARGAIN.

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eculiarly adapted for the above, that will never ain the plate. 9d. per pint, 4s. per gallon.

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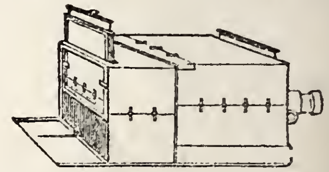

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Photographic Journal,

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The Liverpool & Manchester Photographic Journal.

New Series. No. 11.—JUNE 1, 1857.

ɪᴇ writer of the present address has been roduced to the notice of the readers of this urnal in terms so flattering that it is with no ght amount of trepidation that he to-day ters upon his labours. He feels that he has pass through an ordeal which at its first say may go far to falsify the predictions ich have fallen from the friendly, but, in this se, too glowing pen of his predecessor. If, wever, his readers will be good enough to miss from their minds all anticipatory oughts, and judge the present editor only by amount of usefulness which it is his deter-ation they shall find in him, he will no longer ink from encountering their impartial, and he sts he may be allowed to add, friendly scrutiny.

t will be to him a pleasant, though not trifling task, to make in this Journal a mpt, trustworthy, and impartial record of important discoveries and improvements in way relating to Photography. The matters be selected chiefly on account of their direct ity, and as often as possible tested previously heir insertion, so as to admit of critical and gestive comment at the time of publication. lthough *practical* Photography will always m the writer's earliest attention, he will forget to direct attention to those higher estigations which in many cases have sprung n the working of practical questions, and n which practice itself often receives, in rn, aid and instructive elucidation. On this on all other points the writer will always e his best attention to the communications suggestions of his friends and readers; and now respectfully asks for their co-operation support.

lis best acknowledgments are due to Mr. okes for his kindness in rendering easy many he first steps in his path. In Mr. Crookes's ds the *Liverpool and Manchester Photographic rnal* has acquired a reputation for combining ntific accuracy with practical usefulness. has, moreover, preserved its character for in-endence and impartiality, without which quali-the writer would not value its possession for ngle instant; and in these respects it shall suffer in his hands. And now, in return and in conclusion, he heartily wishes Mr. Crookes that which all his friends anticipate for him—a long career of usefulness and honour, as Editor and Secretary to the Photographic Society of London.

London, June 1. T. A. Malone.

Professor Frankland, of Manchester, is now giving an important course of lectures at the Royal Institution of Great Britain, upon "The Relations of Chemistry to Graphic and Plastic Art." With regard to photography, he observed that it was essentially a chemical art; but as it had been recently fully treated upon by Mr. Malone, he would confine himself to an exposition of the principles which he believed governed the production of the image. He concluded that, in all photographic processes by development, the iodide of silver was the principal basis: this iodide which existed in the sensitive paper in an amorphous condition became altered molecularly, roughened or crystallized it might be, by the action of light, and upon these rough particles silver was deposited from the developing mixture. With regard to the daguerreotype, he thought that similar molecular conditions existed, by which the mercurial vapour condensed by preference upon the rough or crystalline particles which constituted the latent image. This kind of action was shown by taking a plate coated with dust and writing upon it with the finger, by which the dust was of course partially removed. On then breathing upon the plate, globules of moisture deposited only upon the dusty surface. In the next lecture Professor Frankland will treat of Photo-galvanography and Photo-lithography.

The colour of the sheet glass used in the photographic operating room demands more attention than it has yet received. A remark made by Professor Frankland, in one of his lectures, suggested to us the thought that it may be desirable to try if glass containing protoxide of iron will allow more of the photogenic rays to pass than the same kind of glass in which the iron is purposely per-oxidised, to remove the bluish tint produced by the protoxide. The omission of the nitre or other oxidising agent used in glass making is all that will be required.

The efforts made in behalf of Mr. Archer's family have received an immense stimulus from the dissemination of Mr. Corey's address, delivered at the meeting of the Liverpool Photographic Society on the 19th ult. Our readers will need no prompting from us to induce them to embrace warmly the plan of procedure Mr. Corey has suggested.

We purpose visiting the Manchester Art Treasures' Exhibition in a few days; and while calling the attention of our readers to an article in another page by Σ, we hope to be enabled to give in a future number our own impression of the photographic part of the collection.

In future it will be our aim to give greater variety to these pages, and, as often as possible, furnish *the substance* of important papers, instead of printing *in extenso*, excepting where curtailment might involve obscurity.

Danger of Cyanide of Potassium.—The late controversy in *The Times* upon this subject will be set at rest in the minds of all who are neither foolish nor imprudent, by a perusal of the case of Mr. Thomas Rose, of Glasgow, published in *Notes and Queries*, (2nd s. No. 73):—"Once" says Mr. Rose, "when removing a plate from the slide, for the purpose of fixing, I cut the end of my thumb severely, with the raw edge of the glass, and was made aware of the accident by unwittingly resting my hand where I had overturned a small measure of cyanide. The smarting pain was almost intolerable, and the whole hand became swollen and much inflamed. I got relief by suffering the hand to lie for nearly half an hour in a bason of clear water, but I suffered some inconvenience for several days. Probably the perils of cyanide may be exaggerated, but there can be no doubt that more or less [nay the greatest] danger attends its [careless] use, and it is surely wisdom to err on the side of prudence."

Patent for Dry Collodion and Transfer of Films.—Richard Hill Norris, M.D., of Birmingham, has patented a method of introducing "into the pores of the collodion film, while still wet from the nitrate of silver solution, or after washing, certain substances soluble in or penetrable by watery solutions, which substances, occupying the pores of the collodion film, prevent its condensation on drying, and retain it in a sensitive and pervious state." The films are "capable of retaining their sensitiveness for an unlimited period." Hitherto hygrometric substances have been employed. "The substances I employ to saturate the collodion films are very numerous, but the process may be described as follows:—having produced in the film the sensitive iodide of silver by any of the ordinary known means, I immerse the film, for varying periods, in a solution of gum arabic, or of dextrine, starch, gelatine, albumen, gum tragacanth, vegetable mucilages, caseine, gluten, or other such like substances, capable of fulfilling the above-named conditions; the films are then dried and are ready for exposure to light, or may be kept for any convenient length of time and used as desired. The second part of my invention consists in a method of transferring photographic films from glass plates to elastic plates of gelatine. The mode in which I effect this is as follows:—A strong solution of gelatine is poured over the films and permitted to dry; when dry it is coated with plain collodion, and may be readily stripped from the glass, and then possesses the advantages of elasticity, compactness, lightness, and freedom from breakage.—*Repertory of Patent Inventions*, No. 173.

LIVERPOOL PHOTOGRAPHIC SOCIET[Y]

The Fifth Meeting of the Society took place [at] the Royal Institution, on Tuesday, the 1[9th] instant, Charles Corey, Esq. in the chair.

It was proposed by Mr. Forrest, and second[ed] by Mr. Duckworth, and resolved, that the me[et]ings of the Society be adjourned until Septe[m]ber: the next meeting will, therefore, ta[ke] place on Tuesday, September 15th.

The Chairman exhibited a beautiful specim[en] of untouched photography, a portrait of [the] talented author and actor, John Brougham, [of] New York, by C. Frederick, of the Broadw[ay], which was much admired.

Mr. Keith also exhibited a specimen of [the] new Hallotype process, patented by Messrs. [H...] and Gurney, of New York. A peculiar effect is p[ro]duced in this process by the combination of t[wo] prints from a collodion negative. The upper [one] is attached to the back of a glass, and made tra[ns]parent by varnish, another picture is then roug[hly] and strongly coloured, and placed underneat[h].

Mr. Bell stated that he had been for a l[ong] time annoyed with the granular appearanc[e of] waxed paper pictures, and also minute red sp[ots] in the finished negative. He was incline[d to] attribute this to using a super-saturated solu[tion] of gallic acid. Having since tried a wea[ker] solution he had not been troubled with the s[ame] defect.

Mr. Cooke corroborated this view.

Mr. Duckworth was more inclined to a[ttri]bute it to using too strong an iodizing soluti[on], and also insufficiency of acetic acid. He [ha]d made more granular negatives with Townse[nd's] process than any other, which he attribute[d to] the large quantity of iodide in the paper.

The Chairman, from his own experience [re]commended the substitution of citric for a[ceti]c acid. He exhibited some large negatives d[eve]loped with pyrogallic and citric acid, w[hich] leave little to be desired.

Mr. Bell announced that the next dist[ribu]tion of the National Exchange Club would [take] place on the 25th June. All prints intende[d for] exchange must therefore be forwarded not [lat]er than the 18th June.

Some specimens of photographic paper [ma]de by Hollingsworth were produced, as al[so] a very superior sample made by Messrs. A. [P]ie and Sons, of Aberdeen. The quality was [qui]te equal to the French papers, while the pric[e w]as less than one-half.

In answer to a question from Mr. Har[din]g, as to the use of prisms for reversing [t]he image, the Chairman recommended tha[t t]he glass should be placed in the slide wi[th t]he collodion side up; having then another [gl]ass with small pieces cemented on the corner[s, l]ay this down upon the face of the collodi[on] to protect it from the spring at the back; [the] picture will then be taken through the [gla]ss, instead of on the surface, and will be corr[ec]t in position. This plan had been most succes[sfu]lly practised by the Rev. Mr. Banner.

At the last meeting, Mr. Keith state[d t]hat some polished crown glass had a roughn[es]s on one side, which fogged the picture. In a[ns]wer to an enquiry from the Chairman, Mr. F[or]rest stated that this would only occur in a [s]mall

oportion of the glass, and could readily be tected by rubbing the back of the hand over

In the process of manufacture, the glass, hile in a state of semi-fusion, sometimes took a little dust from the fire, which was afterards drawn by centrifugal force to the edges the table. He also stated that he intended prepare some plates which would very much nplify the present mode of producing vignette ints.

The CHAIRMAN then read the following dress relative to the recent decease of Mr. Scott Archer :—

"The present is an occasion that calls loudly on us as a body of intellectual and energetic en, to offer a grateful tribute to the memory one, by whose enterprising research and nerous sacrifice of his own interests we have tained the very mainspring of our enjoyments, amateurs of a most fascinating and elevating irsuit. The public journals have acquainted u with the death of Mr. Frederick Scott cher, leaving a family, it must be regretted by l thinking and feeling men, almost, if not tirely, unprovided for. A short retrospect of e last seven years will clearly show how ery man who knows the use of a camera (and here shall we draw the limit of so vast a body this comprehends), either in this country, the ntinent of Europe, and of America, and a large rtion of India, indeed the whole civilized rld, one and all, are called upon, not merely offer the outward tokens of respect to his emory and sympathy for those whom he s left behind, precious as such tributes would fallibly be to the bereaved ones, but are also lled upon for substantial proof of their gratide for his disinterestedness, by rescuing those hom he loved while in life from the bitter ivations of poverty and neglect; and the st stimulus will be to reflect that, to enrich us th the free use of these fruits of his labours, deprived those dear ones of that which would ve left them, at least, in affluence, if not in ssession of great riches. There is no question at, had Mr. Scott Archer, in the exercise of a ry excusable worldly wisdom, tied up the exusive right to the use of collodion by the patent ws, that the produce of wealth to him would ve been enormous. Now, we do not intend to aw invidious comparisons, but must contrast e line pursued by others whom love of the orld's gear, or a limited desire for their own rsonal aggrandizement, have so strained the w into an endeavour to coerce even the amaur to submitting to their exactions. How ble, how widely antagonistic to this narrow licy was that of the object of our present gard. For about the previous seven years e absolute necessity of finding some medium t included in patent rights for reproducing e fairy imitations of the beauties of nature d art by the use of the camera began to be ore and more urgently felt by the vastlycreasing body of admirers of the novel and lightful art. The craving desire for new and reater wonders from the actinism of light was ammelled and kept down by a species of tyranny the possessors of what had falsely become ested rights. Our enterprising neighbours, the rench, devised a menstruum for the spreading of an energetic film, namely, albumen, to which they have adhered more or less faithfully to the present day. Though this, doubtless, admits of photogenic reproduction with marvellous exactness and minute fidelity, yet the method of working is troublesome and inconvenient. About September, 1850, Mr. Scott Archer perfected his experiments with a liquid the name of which was barely recognized, for the element from which it was produced had its birth but a year or two before. The success was immediate. The great fact of pictures of, as it has since proved, instantaneous production, and of ultimate infinite reproduction, in great variety of form, not merely as the toy of the fancy, but as the medium for some of our most scientific and elaborate efforts of genius, was at once accomplished, and with a generosity unequalled Mr. Archer parted with the magic wand that would have placed him amongst wealthy and prosperous men. Without a single reservation he published the whole of his process in the *Chemist* of the March following. Certain modifications of this formula have been put forth from time to time, but the basis remains still the same: the collodion of Mr. Scott Archer is still in use by every photographer in the United Kingdom, and will be to the end of time. To the amateur —for here we recognize none other, this free gift was a priceless boon, but how shall we regard the memory of a man who deprived his offspring almost of bread, to disperse that bread amongst thousands, for a new class amongst the already crowded competitors for public fame and private sustenance now sprung up, and it is estimated that the discovery of Mr. Scott Archer affords the means of living to not less than fifty thousand of Her Majesty's subjects, without taking into the account those who are dependant upon them in their families, and those who work for them. Here is a public benefactor—here is a man worthy of all honour—shall we give pensions to those who have cultivated letters: improved the taste of the public mind, and leave unprovided for, the family of him who has freely given bread to thousands. The parent society in London has set a noble example and collected instanter the sum of £160. The act is worthy of so large and enlightened a body, all honour to them; in our limited sphere we cannot hope to emulate them, but we must remember that their contribution, rich as it was, is only for the present time; the hour of privation is only deferred by this; we must do our best to ward it off altogether from the family to whom we owe so much. The French set us an example to teach us our duty here, they gave to Daguerre a pension of 10,000 francs; let us use every effort to induce the Minister to counsel the Crown to provide entirely for this destitute family. Her Most Gracious Majesty, the noblest English mother, will feel for the desolation of one who has contributed even to her enjoyment, exalted as she is, and her impulses are ever so well directed, that they need only to be called into action to be applied at once to so desirable a purpose. Be it our act, then, through our secretary, to open a communication with that English Mæcenas, Mr. W. Brown, who confers honour upon the southern division of this our county, by representing it in Parliament,

and if the subject in his hands do not of itself speak trumpet-tongued to the Prime Minister, let it be also backed up by the support of the members of the borough, Messrs. Horsfall and Ewart, who, if not previously interested in the subject, would gladly embark in a cause evincing the nation's gratitude. Our work is plainly before us, by moving the fraternity, through the medium of kindred societies, to prevent the present wants of those he has left behind. To posterity we must leave the work of awarding to his memory that honour so eminently his due—his name will be connected with the best effects of photography till time shall be no more.

> 'Lives of all great men remind us,
> We can make our lives sublime:
> And departing leave behind us,
> Foot prints on the sand of time.' "

It was proposed by Dr. Ayrtoun, and seconded by Mr. Bell, that the paper just read be forwarded to "*The Times*," for insertion, and that the Secretary be empowered to communicate with William Brown, Esq., M.P., and with the various provincial societies upon the matter. A subscription list was also opened by Mr. Forrest, Treasurer, for the relief of Mrs. Archer, which was headed by Mr. Keith with £5.

A vote of thanks was passed to the Chairman, and the meeting separated.

PHOTO-CHEMICAL RESEARCHES.

The following abstract is taken from the Proceedings of the Royal Society, (vol. viii., No. 24.) It contains an account of the important joint labours of "Professor Bunsen, of Heidelberg, and Henry Enfield Roscoe, B.A., Ph.D." As these researches led to the construction of an instrument to record certain chemical work done by the solar rays, and also serve, it is believed, to explain some obscure photographic phenomena, we do not hesitate about laying them before our readers.

"Chemical affinity, or the force which regulates the chemical combination of two bodies, is like all other forces, a certain definite quantity. Hence it is erroneous to say, that under different circumstances the same body can possess different affinities; more correctly we should say, that in the one case the bodies are able to follow the chemical attraction of their molecules, whilst in another case opposing forces render this combination impossible. These opposing forces may be considered as resistances similar to those exerted in the passage of electricity through conductors, in the distribution of magnetism in steel, and in the conduction of heat. We overcome these resistances when by agitation we increase the formation of a precipitate, or by insolation effect a decomposition.

"We call the act by which these resistances to combination are lessened, and the formation of a chemical compound promoted, 'chemical induction;' and we specify this as a photo-chemical, thermo-chemical, electro-chemical, or idio-chemical, according as light, heat, electricity, or pure chemical action is the force which promotes the combination.

"The phenomena of photo-chemical induction are particularly interesting, as affording starting points from which we may gain a knowledge of this mode of action of affinity.

"That on exposing a mixture of chlorine an hydrogen to the light the action does not com mence to its full extent at once, was observe by Draper in 1843. An explanation of this fac was given by the supposition that the chlorin underwent on insolation a permanent allotropi modification, in which state it possessed mo than usually active properties. This explana tion is, as we shall show, erroneous, and th whole phenomenon is caused by the peculia action to which we have given the name photo-chemical induction. When the standar mixture of chlorine and hydrogen is exposed t a constant source of light, no action is at fir perceptible; after a short time, however, th action becomes visible, and gradually increas until a constant maximum is reached. Exper ments made with different amounts of light fro different luminous sources, showed that th times which elapsed from the beginning of th exposure until the maximum was obtaine varied very much, according to circumstance In one case the maximum action was reached i fifteen minutes, in others after an exposure three or four minutes. The first action was i one case visible after six minutes' insolation, others after one minute, whilst in some exper ments a considerable action was observed in th first minute.

"The condition modifying the action of th induction which we first examined, was th action of the mass of the insolated gas. Fro various experiments, it was found that the dur tion of the induction increased with the volun of exposed gas, (by constant amounts of ligh and curves have been drawn, representing t increase of the induction for the various volum of gas employed.

"We next examined the dependence of t duration of induction upon the amount of lig to which a constant volume of gas was expose and experiment showed—

"1. That the time necessary to effect the fi action of the photo-chemical induction decrea with increase of light, and in a greater ratio th the increase of light.

"2. That the time which elapses until t maximum is attained also decreases with i crease of light, but in a much less ratio.

"3. That the increase of the induction procee at first in an expanding series, attains a ma mum, and then converges when the true ma mum action is attained. The law regulati the increase of the induction by increase light, we have rendered visible by curves.

"The results of these experiments sugges the question, Is the condition of increased co bining power, into which the mixture of chlo and hydrogen passes by insolation, perman or is it confined to the time during which gas is exposed to light? In order to determ this question, the sensitive gas, which had st for some time in the dark, was exposed t constant source of light, and the time no which elapsed before the maximum action reached; the apparatus was then darkened one minute, and then again insolated, and time watched until the maximum action again observed. These observations were peated several times, each period of darken being longer than the preceding. Thus c-

ted, the experiment led to the important clusion, that the resistance to combination rcome by the influence of the light is soon ored when the gas is allowed to stand in dark. Curves expressing the effect produced nduction by darkening, and by exposure to t, have been drawn.

We have explained the fact, that the mixture hlorine and hydrogen does not combine in the :, by the supposition of the existence of a stance to combination which is overcome n the gaseous mixture is exposed to light. resistance to combination can be increased various circumstances. The presence of a small quantity of foreign gas in the dard mixture of chlorine and hydrogen is cient to cause the resistance to be increased very great extent. An excess of $\frac{3}{1000}$ of rogen over that contained in the normal gas, ced the action from 100 to 38.

[n these experiments we have to do with purest form of the so-called catalytic ac-, to which the photo-chemical phenomena losely related. The quantative estimation ie relations which exist in the phenomena ntact, between the mass of the substance, time and other modifying conditions, has is yet been possible, owing to the absence ny case in which these relations are exhi- l in their simplest form. Our method of pho-iemical measurement points out a direction h promises to afford interesting results erning these quantative relations; but in communication we restrict ourselves to the deration of these phenomena in so far as influence the action of photo-chemical in-on, intending on a future occasion to enter fully into the new field of research ated.

'he contact action of foreign gases is still strongly seen in the case of small quanti- of oxygen. This gas, when present in tities amounting only to $\frac{5}{1000}$ of the total ne of gas, diminishes the action from 100 7, whilst $\frac{13}{1000}$ reduced the action from 100 3. Excess of chlorine acted in a similar ıer though not to so great an extent, $\frac{10}{1000}$ is gas reducing the action from 100 to 60·2, $\frac{180}{1000}$ from 100 to 41·3. On examining the of small quantities of hydrochloric acid upon the induction maximum, we found, nately for the accuracy of the indications r instrument, that an amount of $\frac{1\cdot3}{1000}$ of this oes not produce any appreciable effect on ıction of the induction. Uninsolated gas ound to act similarly on the normal mix- the admission of $\frac{6}{1000}$ of non-insolated educing the action from 100 to 55. Curves been drawn, representing the relation be- ı the action and the amount of foreign ity introduced. Several series of experi-s also showed that a mixture of chlorine ıydrogen, which was so nearly pure that eration of the maximum action was observ- was longer in attaining the maximum the perfectly pure gas; hence the duration induction serves as an exact measure of senoe of all foreign gases in the standard ıre.

"n explanation of the laws of photo-chemi- duction derived from the above-mentioned experiments, might easily be found in the assumption that the chlorine or the hydrogen, or both gases, undergo, upon exposure to light, a change similar to that between common and ozonized oxygen, or that these two gases can, under certain circumstances, be invested with active, and, under other circumstances, with passive properties. If this hypothesis be true, each gas must undergo this peculiar modification when separately exposed to the action of the light. That this is not the case was shown by the following experiment:—The two gases were separately evolved, and each led through a long glass tube, in which they could be separately exposed to the action of diffuse and direct sunlight. After this exposure, the gases passed through a connecting tube into the apparatus, in which a constant source of light gave the duration of the induction. Thus alternately insolating and darkening the separated gases, we observed the effect on the gases subsequently mixed and exposed to lamplight. No difference was perceptible in the duration of the induction between the gases previously insolated and those evolved in the dark. Hence we may conclude, that the light does not effect a permanent modification, either of the chlorine or hydrogen, but that the combination produced by the light must depend on photo-chemical action affecting only the increasing attractions of the chemically active molecules.

"All the curves representing the increase of the induction under various conditions have a common form, and a point of flexure at which the maximum increase occurs. In order to determine whether this common property of the curves arises from the general mode of action of affinity, or whether the light plays an essential part, we have made experiments upon idio-chemical induction, *i.e.* action in which pure chemical attractions alone effect the alteration. For this purpose we employed a dilute aqueous solution of bromine with tartaric acid, which mixture, when left to itself in the dark, undergoes decomposition, hydrobromic acid being formed. By determining the amount of free bromine contained in the liquid at different times, we became acquainted with the rate at which the decomposition occurred. Analysis showed that the amount of hydrobromic acid formed was not the same in equal spaces of time; and curves representing this increase were found to have the form obtained for the photo-chemical induction. Hence the cause of this maximum increase appears not to lie in any peculiar property of light, but rather in the mode of action of affinity itself.

"One of the many interesting applications of the laws of photo-chemical induction relates to the phenomena of photography. As an instance of this application we cite the remarkable observations of Becquerel, which induced him to assume the existence of certain rays which can continue, but not commence, chemical action. In order to explain the phenomenon observed by the French physicist, we do not need to suppose the existence of a new property of light, as the facts are easily explained by the laws of photo-chemical induction; and we are satisfied that these relations, which we have examined only in the case of chlorine and hydrogen, occur in a

slightly modified form in other photo-chemical processes.

"Having determined in this part of our investigation the most important phenomena of photo-chemical induction, we shall in the next section consider the laws which regulate the chemical action of light after the induction is completed."

THE STEREOSCOPE.

The following is a complete report of the remarks of Mr. Malone on the subject of the stereoscope, as made by him at the meeting of the London Photographic Society on the 7th ult., with Mr. Shadbolt's reply:—

Mr. Malone.—I made a few remarks at our last meeting, and I have little more to do than to repeat those remarks, supporting them by additional statements of facts. A few weeks since I had occasion to visit Paris, and I then paid a special visit to M. Ferrier, and also to MM. Soulier and Clouzard, these gentlemen being the chief makers of the transparent slides generally on sale in this country. They informed me, that as a rule they placed their cameras wide apart in taking their views, and quite ignore the proceeding of only placing the lenses the distance of the two eyes apart. In a well known view taken from the top of *Notre Dame*, their cameras, I was assured, were placed as far apart as the width of the tower admitted, the distance being about 15 *metres*, or more than 15 yards English. Again, as a rule, the pictures of MM. Soulier and Clouzard are taken so that the axes of the cameras converge to a point at about the middle distance, or even to some point beyond. Thus the angle is not a great one, perhaps from three to six degrees, varying with the subject; still the axes converge. Another *fact* to which I wish to direct the attention of the meeting is this: those who insist upon taking pictures with the cameras placed only the distance of the two eyes apart, do not understand the instrument invented by Professor Wheatstone. They doubtless understand some use of their own, to which they put Professor Wheatstone's instrument, but, I repeat it, they quite misunderstand the object of his invention. However, apart from all speculation, and as a matter of fact, it is found that if you take a picture from the tower of Notre Dame, for example, with the lenses placed apart only the distance of the two eyes, you do not get that solid representation,—that model-like appearance, if you will,—which at once creates surprise and pleasure, in the beholder of pictures taken from widely separated points. And here let me observe, that those who take views of a *near* object, with cameras side by side, work under a considerable angle as respects that object, and they so far fulfil Professor Wheatstone's law; but if they retire far back from that object without widening the cameras, they lessen the angle and fall into error they were at the outset free from. To get the same angle you must necessarily widen the cameras. Take as a test-object a life-size statue placed on a square pedestal: if you do not separate the cameras enough, you will, at a certain distance, get distortion of the base in a certain direction; now place the cameras unduly apart, and you will find distortion in the converse direction: the true perspective representation evidently lies somewhere between. Moreover, if you do not separate widely, when at a distance from your object, you will have the solid appearance shrunk to a *bas-relief*. In a landscape you have a mixture of objects; those near at hand will be viewed under a considerable angle, and therefore will be represented comparatively solid, though the cameras are near together, but then distant objects will be perfectly flat. The amount of separation and of converge[nce] must in such cases be a matter of great judgm[ent], and that is the opinion of Professor Wheatstone [and] the French operators. No set of rules can be g[iven] to suit all cases; all will depend on the object in [the] picture which is wanted to be in the best cond[ition] as to true solidity. Yet one rule will remain [un]alterable: whenever your chief object is distant, [and] the foreground is unimportant, you must sep[arate] your cameras wider and wider as the distance [in]creases, or fail to get that true solidity which [I am] sure a majority of observers will prize. A vie[w of] the table of the well known Egyptian colossal fig[ures] appears to me to err in this respect. There s[eems] to be nothing in the foreground to forbid a [wide] separation of the cameras: had there been, of co[urse] a compromise must have been made. To ask [for] very near and comparatively very distant objec[ts at] once solid and free from distortion, is to ask f[or an] impossibility.

Mr. Shadbolt.—Perhaps I may be permitt[ed to] reply to Mr. Malone, who professed to state fact[s, but] has stated opinions and called them facts. I [main]tain, as a fact logically deduced from the laws o[f the] science of optics, that if you move the camera[s any]*thing* more than the distance between the two [eyes], you do not reproduce nature. Many *say* they [want] to produce nature, when, *in fact*, they want to [pro]duce something else. You may by exaggerati[on of] distance produce a very pretty and effective pi[ctures], but it *is not nature*. From the top of Notre [Dame] in Paris the distant objects do not present them[selves] to the eye in what Mr. Malone calls stere[oscop]ic manner, but which I presume he means solid. I understand stereoscopic pictures to represent a [so]lid object as it appears in nature, but very dista[nt ob]jects do not appear solid.

[The reader must readily observe that [it is] not for a moment supposed that a s[tereo]scopic picture is a representation of Natu[re as] seen by the two eyes from any single p[oint of] view: still the result is *natural*, inasmuc[h as it] recalls to us the original object in a manne[r free] from distortion..—Ed. L. & M. P. J.]

ON LUNAR PHOTOGRAPHY

By Thomas Grubb, M.R.I.A. &c.

"The attempts hitherto made to obtai[n g]ood photographs of our satellite appear not t[o h]ave been as successful as could be desired, n[or] can this be a matter of surprise when the att[end]ant difficulties are considered.

"The interesting paper of Mr. Crookes [on] the subject, republished in the last two num[ber]s of the London Photographic Journal, giv[es] the details of the *modus operandi* by which [he] has produced perhaps the best lunar photo[gra]phs extant. This communication will be [pri]marily confined to a consideration of what [ma]y be termed the *instrumental* portion of the [sub]ject, or, in other words, the apparatus (in add[itio]n to that required for ordinary photograph[y]) for obtaining lunar photographs.

"Before entering upon the more im[me]diate subject of my paper, I would direct the at[te]ntion of those interested in the *science* of phot[ogr]aphy to the apparently anomalous fact, as expe[rie]nced both by Mr. Crookes and myself in our [re]spective telescopes, that the actinic focus [(o]r the lunar rays) is *longer* than the visual. It is generally understood that a compound [ob]ject-glass made as nearly achromatic as [po]ssible, will have its actinic focus *shorter* th[an] the

ual, and there has been some discussion on : value of having (or not having) these two i brought to coincidence, which some pracal persons state they effect, by making their nbinations a little over-corrected for the ual rays or colours. I have carefully exaned some of these combinations, the works first-rate English artists, and have been rprised to find them exhibit signs of *under*rrection of colour, rather than of over, while me view lenses I made for my own use, and ll balanced in colour (visually), show no preciable difference between these foci.

"Theory certainly appears to indicate a slight it only slight) over-correction for colour as quired to make the chemical and visual foci incide. Why then does it happen that Mr. ookes' and my own experience indicate the ntrary? It cannot be ascribed to errors her of instruments or of observation, as the lescope is a far more delicate test than an dinary photographic combination. That used Mr. Crookes' experiments has, I believe, a unich object-glass of fine performance; and at used by myself is, I apprehend, able to mpete with it in quality, and much larger size, being about $12\frac{1}{10}$ inches in aperture and feet focus. It is only a few days since I certained the facts to be as stated, and I ive had no time to theorize upon them; but e whole matter appears well worthy of the tention of those interested in photographic ience.

"To proceed with the more immediate objects this paper, which are, to contribute such nts as seem to me likely to prove of use to iose who are at once in a position and disposed practise lunar photography, and also to reove an impression which, I fear, Mr. Crookes' iper is in some measure likely to produce, iz. that none but first-rate instruments, worked y consummate skill or experience, can be made vailable. I would also first state, that a little xperience will probably show that the uncerin and unsteady state of our atmosphere hat great drawback to ordinary observation ith telescopes of large dimensions) is also a ar to the perfection of lunar photography.

"The thinnest gossamer cloud, or a haze of arely visible vapour in the moon's region, either f them little interfering with an observation, re both sadly against obtaining a good photoraph; while the quivering of the image, caused y currents of air of different densities passing etween the object and the instrument, and which often does not preclude the observer rom obtaining momentary distinct glances, nust seriously mar the sharpness of the photograph. In like manner the leaves of a tree, hough rustled by a light breeze, can be disinctly seen for moments by the eye, when to hotograph them distinctly (except instantaeously) would be impracticable.

"We want, not one or a dozen, but at least 100 different photographs of our satellite, so as to present to our view every available portion of ts surface under the effects of (to it) a rising or setting sun; and it is only by seizing on the ew and far-between moments of highly favourable atmosphere that we can hope to obtain such a series, sharply defined, at least in this unfavourable climate. It is therefore desirable that no one who possesses the required appliances should be unnecessarily deterred from the pursuit: of these appliances I shall shortly speak, in the order of their probable efficiency.

"A large telescope, either refracting or reflecting, equatorially mounted, and moved by adequate clockwork, is, though by no means necessary, certainly, *par excellence,* the thing to be desired; but if such be forthcoming, and the clockwork once *adjusted to the mean apparent motion of the moon in Æ*, any attempts (by hand) to make the motion of the telescope more strictly conform to that of the moon (in that direction) are more likely to be injurious than otherwise.

"The mean difference for 24 hours between the moon's average and actual motion in Æ, I find, from data taken from the Nautieal Almanac, to be under 2 minutes, therefore the mean difference for 4 seconds of time (that in which Mr. Crookes took his negatives) is that part of 2 minutes which 4 seconds bears to 24 hours, or say $\frac{1}{180}$ of a second of time, or $\frac{1}{12}$ of a second of arc. To express this difference *photographically*, the resulting indistinctness would be less than that due to the shifting of $\frac{1}{10000}$th of an inch, in an image of the moon of 2 inches diameter. So far, therefore, it would be as useless as unwise to interfere with the movement for following the moon in Æ, if effected by good mechanism, even should the time of exposure be ten-fold that of 4 seconds; conversely, should the time of exposure not much exceed 4 seconds, the displacement of the image, owing to a change of declination of the moon (though the latter be occasionally ten times in amount that of Æ), will not sensibly affect the distinctness of an image charged under all ordinary circumstances with a far greater amount of indistinctness arising from atmospheric disturbance.

"There are intervals, however, when the atmosphere is both clear and also in that state of repose which admits of obtaining results commensurate with the highest perfection of the best instruments; and if it be hereafter found of advantage (a matter which at present seems doubtful) to take secondary and enlarged images *at the first operation*, requiring perhaps some minutes' exposure, *then* I would recommend the adoption of the following method, instead of hand work, for following the moon in her varying declination.

"The portion of the apparatus connected with the telescope for containing the dark frame to be made capable of sliding by a small quantity, and acted upon by a screw connected with a small clock movement; this motion to be capable both of adjustment and of being reversed: the value of the common divisions of the screw once ascertained, would afford data for forming a table, from which, with the assistance of the Nautical Almanac, the required correction for the differing declination N. or S. of the moon could be applied.

"With such an addition to a really good equatorial, I can see no difficulty in exposing a sensitive surface for minutes with all the accuracy desirable, and such lengthened exposure will no doubt be required where negatives

of 6 to 8 inches diameter are attempted. On the other hand, where a short exposure, say from 4 to 20 seconds only is required, and where it is found necessary to keep both Æ and Dec. motions "in hand" by the usual means of Hook's-joints, handles, or other contrivances, any assistance to be derived from clockwork seems problematic.

"An equatorial mounting is, however, by no means necessary for photographing the moon's surface; and where the time of exposure does not exceed 30 seconds, the apparatus devised by Lord Rosse seems admirably suited. It may be shortly described thus:—On a flat surface attached to the telescope, and parallel to the plane of the image, is attached a sliding plate, the slide being capable of adjustment to the direction of the moon's path at the time of operating. The slide is actuated by a screw moved by clockwork, and having a governor or regulator of peculiar construction which acts equally well in all positions (this, in the instance before us, is necessary); the clockwork being once adjusted requires no change, but the inclination of the slide must be effected by trial for the moon's path at the time of taking the photograph, the telescope itself remaining firmly clamped. This apparatus is peculiarly fitted for large telescopes not equatorially mounted, and though a little more troublesome in the management, as requiring constant rectification of the slide to the moon's path, promises to afford the means of taking photographs of the moon as perfect as those which can be obtained with the aid of the best equatorial arrangements.

"This communication having already exceeded its intended length, I defer to another, the consideration of some details, including that of obtaining large negatives at the first operation.

"The few negatives I have as yet taken are only of that size afforded by the direct image formed by the object glass, viz. $2\frac{1}{16}$ inches nearly, and the positive prints from these on the table do not exhibit the sharpness of the negatives: that portion of the image corresponding with the moon's bright limb, which would be most affected by any want of perfect uniformity of the motions of the teloscope and moon in Æ, is in the negatives intensely sharp, even where the exposure lasted for 45 seconds, thus proving the efficiency of the clockwork unassisted.

"The actinic force varied much on the several nights of operating, 10 seconds giving a full negative in some, others requiring 30 to 40 seconds' exposure. The wind was east, the definition middling, and consequenly leaving a prospect of obtaining better results in more favourable states of the atmosphere. The sensitizing bath was new and of fused nitrate; the collodion, "Thomas's"; and it is remarkable, that while the collodion employed gave excellent negatives with good half-tone, of day objects, the negatives of the moon, with all lengths of exposure, have excess of light and shade, thus indicating a greater actinic difference of intensity than of visual in the dark and light portions of the moon's surface, and suggesting the necessity of using a peculiar collodion of low intensity for obtaining the best lunar negatives."
—*London Photographic Journal.*

SPECIFICATION OF MR. FOX TALBOT'S CALOTYPE PATEN

This specification relates to letters pater "bearing date at Westminster the 8th day February, in the 4th year (1841) of the reign Her present most excellent Majesty." Aft the usual announcement of the object of t patent, the patentee says, "I do hereby d clare the nature of my said invention, and t manner in which the same is to be perform are fully described and ascertained, in a by the following statement thereof, that to say:—The first part of my invention is method of making paper extremely sensitive the rays of light. For this purpose I select t best writing paper having a smooth surface, a a close and even texture.

FIRST PREPARATION OF THE PAPER.

"I dissolve 100 grains of crystallized nitra of silver in 6 ounces of distilled water; I wa one side of the paper with this solution with soft camel-hair brush, and place a mark up that side by which to know it again. I dry t paper *cautiously* at a distant fire, or else I lea it to dry spontaneously. All this process is be done in the evening by candle-light. The pap thus far prepared may be called, for the sake distinction, 'iodised paper.' This iodised pap is scarcely sensitive to light, but nevertheless should be kept in a portfolio or some dark pla till wanted for use. It does not spoil by kee ing any length of time, provided it is kept in porfolio, and not exposed to the light.

SECOND PART OF THE PREPARATION OF THE PAPER.

"This second part is best deferred until t paper is wanted for use; when that time arrived, I take a sheet of the iodised paper a wash it with a liquid prepared in the followin manner:—dissolve 100 grains of crystallize nitrate of silver in 2 ounces of distilled wate To this solution add one-sixth of its volume strong acetic acid; let this mixture be called Dissolve crystallized gallic acid in distill water, as much as it will dissolve, which is very small quantity; let this solution be call B. When you wish to prepare a sheet of pap for use, mix together the liquids A and B, equal volumes. This mixture I shall call t the name of gallo-nitrate of silver. Let n more be mixed than is intended to be used one time, because the mixture will not kee good for a long period. Then take a sheet iodised paper and wash it over with this gall nitrate of silver with a soft camel-hair brus taking care to wash it on the side which h been previously marked. This operation shou be performed by candle-light. Let the pap rest half a minute, and then dip it into wate then dry it lightly with blotting paper, an lastly, *dry it cautiously* at a fire, holding it considerable distance therefrom. When dry, t paper is fit for use; but it is advisable to use within a few hours after its preparation. (No —That if it is used immediately, the last dryin may be dispensed with, and the paper may l used moist.) (Note second—Instead of using solution of gallic acid for the liquid B, the tin ture of galls, diluted with water, may be use but it is not so advisable.)

USE OF THE PAPER.

he paper thus prepared, and which I name ;ype paper,' is placed in a camera obscura to receive the image formed in the focus e lens. Of course the paper must be ied or defended from the light during the t is being put into the camera. When the a is properly pointed at the object, this is withdrawn, or a pair of internal folding are opened, so as to expose the paper for ception of the image. If the object is very , or the time employed is sufficiently long, sible image is perceived upon the paper it is withdrawn from the camera. But the time is short, or the objects dim, no whatever is visible upon the paper, appears entirely blank. Nevertheless, it pressed with an invisible image; and I discovered the means of causing this to become visible. This is performed as s:—I take some gallo-nitrate of silver red in the manner before directed, and this liquid I wash the paper all over with camel hair brush; I then hold it before a fire, and in a short time (varying from a conds to a minute or two), the image be- o appear upon the paper. Those parts of per upon which light has acted the most ly become brown or black, while those on which light has not acted remain . The image continues to strengthen and more and more visible during some time. it appears strong enough, the operation l be terminated and the picture fixed.

THE FIXING PROCESS.

order to fix the picture thus obtained, I ip it into water, I then partly dry it with ng paper, and then wash it with a solution omide of potassium, containing 100 grains t salt dissolved in 8 or 10 ounces of water; cture is then washed with water, and then dried. Instead of bromide of potassium ng solution of common salt may be used, is less advisable. The picture thus ob- l will have its lights and shades reversed respect to the natural objects, viz., the of the objects are represented by shades, *ice versa*. But it is easy from this picture tain another which shall be conformable to e, viz.:—in which the lights shall be re- nted by lights, and the shades by shades. nly necessary for this purpose to take a d sheet of sensitive calotype paper, and it in close contact with the first upon the picture has been formed, a board is eneath them and a sheet of glass above, he whole is pressed into close contact by s; being then placed in sunshine or day- for a short time, an image or copy is d upon the second sheet of paper; this e or copy is often invisible at first, but the e may be made to appear in the same way has been already stated; but I do not re- end that the copy should be taken on ype paper, on the contrary, I would advise it should be taken on common photographic r. This paper is made by washing good ng paper first with a weak solution of non salt, and next with a solution of nitrate lver. Since it is well known, having been communicated to the public by myself in the year 1839, and that it forms no part of the present invention, I need not describe it here more particularly. Although it takes a much longer time to obtain a copy upon this paper than upon calotype paper, yet the tints of the copy are generally more harmonious and agree- able. On whatever paper the copy is taken, it should be fixed in the way already described.

"After a calotype picture has furnished a good many copies it sometimes grows faint, and the subsequent copies are inferior. This may be prevented by means of a process which revives the strength of the calotype pictures. In order to do this it is only necessary to wash them by candle-light with gallo-nitrate of silver, and then warm them; this causes all the shades of the picture to darken considerably, while the white parts are unaffected. After this the picture is of course to be fixed a second time. The pic- ture will then yield a second series of copies, and a great number of them may frequently be made. (Note—In the same way that I have just explained that a faded calotype picture may be revived and restored, it is possible to strengthen and revive photographs which have been made on other descriptions of sensitive photographic paper, but these are inferior in beauty, and moreover the result is less to be depended upon. I therefore do not recommend them.)

"The next part of my invention consists in a mode of obtaining positive photographic pic- tures, *i. e.*—photographs in which the lights of the objects are represented by lights, and the shades by shades. I have already described how this may be done by a double process, but I shall now describe the means of doing it by a single process. I take a sheet of sensitive calotype paper, and expose it to daylight until I perceive a slight but visible discolouration or browning of the surface; this generally occurs in a few seconds. I then dip the paper into a solution of iodide of potassium of the same strength as before, viz., 500 grains to one pint of water. This immersion apparently removes the visible impression caused by the light (never- theless it does not really remove it, for if the paper were to be now washed with gallo-nitrate of silver, it would speedily blacken all over.) The paper when taken out of the iodide of potassium is dipped in water, and then lightly dried with blotting paper: it is then placed in the focus of a camera obscura, which is pointed at an object. After five or ten minutes the paper is withdrawn, and washed with gallo- nitrate of silver, and warmed as before directed; an image will then appear of a positive kind, namely,—representing the lights of the object by lights, and the shades by shades. Engravings may be very well copied in the same way, and positive copies of them obtained at once, reversed, however, from right to left. For this purpose a sheet of calotype paper is taken and held in daylight to darken it as before-men- tioned, but for the present purpose it should be more darkened than if it were intended to be used in the camera obscura. The rest of the process is the same. The engraving and the sensitive paper should be pressed into close contact with screws or otherwise, and placed in the sunshine, which generally effects the copy

in a minute or two. This copy, if it is not sufficiently distinct, must be rendered visible or strengthened with the gallo-nitrate of silver, as before described. I am aware that the use of iodide of potassium for obtaining positive photographs has been recommended by others, and I do not claim it here by itself as a new invention, but only when used in conjunction with the gallo-nitrate of silver, or when the pictures obtained are rendered visible or strengthened subsequently to their first formation.

"In order to take portraits from the life, I prefer to use for the object glass of the camera a lens whose focal length is only three or four times greater than the diameter of the aperture. The person whose portrait is to be taken should be so placed that the head may be as steady as possible, and the camera being then pointed at it an image is received on the sensitive calotype paper. I prefer to conduct the process in the open air, under a serene sky, but without sunshine; the image is generally obtained in half-a-minute or a minute. If sunshine is employed, a sheet of blue glass should be used as a screen to defend the eyes from too much glare, because this glass does not materially weaken the power of the chemical rays to affect the paper. The portrait thus obtained on the calotype paper is a negative one, and from this a positive copy may be obtained in the way already described.

I claim, first—The employing gallic acid or tincture of galls, in conjunction with a solution of silver, to render paper which has received a previous preparation, more sensitive to the action of light.

Secondly—The making visible photographic images upon paper, and the strengthening such images when already faintly or imperfectly visible, by washing them with liquids which act upon those parts of the paper which have been previously acted upon by light.

Thirdly—The obtaining portraits from the life by photographic means upon paper.

Fourthly—The employing bromide of potassium or some other soluble bromide for fixing the images obtained." [Here follow some processes for producing images on metals, but these were subsequently disclaimed as being more of a scientific than a practical nature].

"In conclusion," the patentee observes, "I do not confine myself to the precise weights and measure of the substances employed in those processes which I have mentioned, since *they may be varied according to circumstances*, but I have mentioned those which I have found on the whole to be the most convenient."

Dated "this 29th day of July, 1841," and enrolled the 7th day of August, in the same year.

The above has been carefully transcribed by ourselves from a "chancery copy," and may therefore be relied upon as an historical piece which we have presumed many will like to possess, whether for the purpose of experiment or of discussion. We may observe that although the most strenuous efforts were made at the trial (Talbot *v.* Delaroche), to set aside the claims respecting the "calotype" paper, yet the jury decided that Mr. Talbot was the true inventor of the entire process which now with greater justice than ever should universally bear his name.

SOLAR PHENOMENA.

"Light was analysed by Sir Isaac New and by that great philosopher pronounced t a compound of seven primary colours. analysis was effected by a triangular piec flint glass—a prism—and although the fa familiar enough to all, it becomes necessa refer to the minute points of the experi that the reasonings of various experimenta may have full consideration. If a small r hole is made in the window shutter of a dark room, and the little sun-beam received up stretched sheet of paper a few yards from hole, we obtain a well-defined, bright, round of white light. There are several plans by w this ray may be decomposed: if we merely the point of a fine needle on the line of its so as to project a shadow on our screen, shadow wi l be surrounded by fringes of col if we fix a knife-edge so as to cut one side o ray, it obeys the power which a solid ma known to possess upon attenuated fluid bodi it is bent, as by an attraction, and the spot *partially coloured* falls lower on the paper it did. Lord Brougham has been investiga this fact, and he has proved, that a ray onc *flexed* cannot be again bent inward until i been *deflexed;* and that a ray in like mann *flexed*, must be again *inflexed*, before it wil hibit a renewal of the phenomenon of ben over an interposed solid.

"It must be remembered that the colou natural objects are due to the decompositi the white ray, dissimilar surfaces having d ent powers of absorption and reflection, and sequently, of communicating to the ey sensations due to the insulated rays, or combinations.

"The prism, however, offers the easiest most exact mode of analysing white light if this triangular glass is interposed in th of the ray, instead of a circular white s long, flame-like image is obtained, prese the most beautiful bands of colour which c obtained by any artifice. The glass ha fracted the pencil of light, and if the place white spot has been marked, the *prismatic trum* will be found to have shifted conside The ray which is the least refracted, acco to Newton, is the red; the ray which i most so, the violet. The order of these col bands is red, orange, yellow, green, blue, i and violet; and the Newtonian law is, every coloured ray has a given degree of r gibility,—that a given degree of refrangi implies a definite coloured ray.

"Modern science has, however, added seven Newtonian rays,—by the researc Sir John Herschel the chromatic scale ha enlarged to nine. If the spectrum is ex through a deep cobalt blue glass, a br *crimson* band is detected below the ordina as seen with the naked eye; and if the pri image is projected upon a piece of tumeric a *lavender gray* ray becomes visible beyo most refrangible violet.

"Instead of increasing the number of p rays, all [many] cultivators of optical scien disposed to reduce them to three—red, y and blue. Sir David Brewster has show these colours may be detected in every

th spectrum, and that it is their blending only wh h produces the orange, the green, and the vi t.

A closer examination of the conditions of th prism—of the undecomposed ray, and of the an ysed result, the spectrum—tends to a convi on that secondary spectra always accompa the prime image, as the secondary rainbow is ually associated with the primary bow.

The point of greatest illuminating power is in e mean yellow ray, from which, in either di ction, light diminishes. On one side we ha green, formed by the overlapping of the ye ow and blue; then *indigo*—the blue declini into blackness. After this, the red, of a m e refrangible secondary spectrum, blends w the blue to form *violet*, and the slight admi ture of yellow from the paper on which the im ge is cast, gives rise to the *lavender gray*. O he other side, the yellow blending with the re produces *orange:* and the red combining w the blue of the complementary image, oc sions the *crimson* or *extreme red* ray. If great ca is taken in producing a prismatic spectrum, a the image is then examined by means of a sm ll telescope, it will be seen to be crossed by nu erous black lines. These are called the l k lines of Fraunhofer, as that celebrated opti n of Munich was the first to investigate th n. These lines are nearly six hundred in nu ber; some of them are broad and decisive, ot rs are exceedingly fine, and grouped toge her into bands. They are very constant in th r positions, when examined under the same co ditions, but they are altered in number by va iations in the media through which the light p meates. These dark bands have been ex- p ned on various suppositions, all of which, h ever, are based on the undulatory hypo- th sis; and they have been generally thought t afford strong evidence in favour of a wave m de of progression. Such are the *luminous* ph nomena of the analysed beam; the *calorific* in uences as distinguished from them must now b examined.—*Mr. Robert Hunt, in the Quarterly Re view, No. XXV.*

(*To be concluded in our next.*)

EXHIBITION OF ART TREASURES AT MANCHESTER.

Ha VING paid several very pleasant visits to this ex hibition, it is with no wish to undervalue the t ent and beauties of the collection, that we a induced to say we have hitherto returned w th a feeling of regret that we have been un- ab e to fix our attention upon specific subjects; w have wandered through saloon after saloon, an d thence round the galleries above, and have m t with so many and varied distracting objects, th t a quiet study of any master-piece has been qu ite out of the question, and we still long for th e time when we can really make a beginning an d follow out, as closely as may be, the design of the spirited projectors. It will hardly come wi thin the province of this *Journal* to give any de tailed account of the inestimable treasures of all kinds which liberal hands have so plenteously su pplied for the edification of our Manchester fri ends, and the numbers to whom their hospi- tal ity will doubtless be extended; a mere refer- en ce to the clever articles on the subject, which all branches of the fourth estate are teeming with, shows how perseverance and assiduity have succeeded in bringing together a gallery of art, in all its departments, whether from the easel, the burin, or the chisel—whether they be the works of Venice, Byzantium, or Limoges—whether they be the fragile wares of the ingenious Chinese, or the more homely products of English Ceramic art—whether they be the warriors' armour, or the peaceful works of the goldsmith—a gallery of these, and a host of other things, such as have never been seen together before. It may, perhaps, seem strange that with an almost unqualified approval, we should have to couple anything like positive regret, but we think we are not alone in regretting that the great principle suggested by H.R.H. Prince Albert, of a chronological arrangement, has apparently been ignored with respect to the department with which we are chiefly concerned; and we fear Mr. Delamotte has had to work with tied hands, and been unable to carry out what seems to have been the leading idea of the rest of the exhibition. Where are the early specimens of M. Niepce (from Dr. Brown, of the British Museum,) and those of M. Daguerre? Where are specimens of the early researches of Sir John Herschel, Mr. Talbot, Mr. Hunt, and our lamented friend, Mr. F. Scott Archer? the only answer is that of echo, merely reiterating the bootless enquiry. It may be said that photography is too young to have any old masters; granted: but remembering the length of art and life's brevity, we look forward into the dim vistas of a far extending futurity, and the thoughts which arise should certainly awaken a deep interest in all that has gone by in the past though few years of photographic history. Our extended requirements may savour of "the unsuspected source of enthusiasm," which a recent writer in the *Quarterly* alluded to, but when we find the same writer paying a tribute of praise, and saying that "photography is the purveyor of a knowledge of cheap, prompt, and correct facts," we think we are not at all unreasonable in claiming a higher place in the category of art than has hitherto been allotted to us. It is a great drawback to the distinctness of this branch of the collection that it should be divided into two moieties, it could surely have been contrived that it might all have been together on one side of the organ; as things are now, few persons will see the whole of it, and a just comparison is next to impossible. A similar distribution is made of the engravings. But the present arrangements are defective in another and important point, viz., that the committee have allotted to some six hundred specimens of photographic art, a bare page and a-half of a catalogue of three hundred and twenty-four pages. We trust that no time will be lost in supplying this want, for until then we are at a loss how to commence such a critical survey of the collection as may enable our readers to compare our thoughts with their own on the subject.

Σ

CORRESPONDENCE.

Want of space compels us to omit noticing several communications which arrived late, but we purpose inserting them in our next number.

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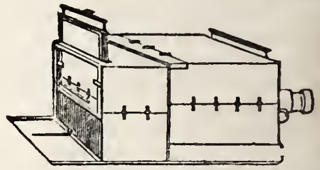

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Liverpool & Manchester Photographic Journal.

New Series. No. 12.—JUNE 15, 1857.

At the last meeting of the Photographic Society of London, held on the 4th instant, Sir W. Newton announced that Mrs. Archer's claims had, by order of Her Majesty, been laid before Lord Palmerston, for his consideration. Sir W. Newton upon learning this took occasion to address himself to Mr. Hayter, of the Treasury, who is necessarily in constant communication with Lord Palmerston, and who has the opportunity of accelerating any steps that may be taken in the present case. Mr. Hayter states that a note has been made with a view of seeing how far the royal bounty fund may be made available, and that as soon as it is in his power, he will inform Sir W. Newton of any further settlement. As this step of Lord Palmerston's implied the offer of a grant only, and not an annuity—which was desired, Sir W. Newton has again addressed himself to Mr. Hayter, and there the matter rests for the present. We do trust that means will be found to accede without delay to the latter request. And now may we beg of our readers to peruse with attention that part of this number headed, "Origin of the Collodion Process." They will there find a narrative, which, for its simple dignity, evident truthfulness, and modesty withal, may serve as a model to all inventors who intend to become their own historians. It stamps Mr. Archer as one extraordinarily great in word and deed, in head and heart. A mere passing *donation* will not satisfy the justice of this case. We advise that *pressure from all quarters* be applied till an annuity has been obtained.

The paper upon "Albumen on Collodion," by Mr. Crookes, is, through his kindness, first *published* in this Journal. It was read at the London Society's meeting of the 4th instant, and was received with decided marks of approbation. The filtering tube was shown to act with wonderful rapidity, even when a very viscid fluid was employed. We shall be glad if our readers will favour us with the result of their trials of the process. We can answer for the great sharpness of definition of which it permits.

Mr. Hardwich's investigations on the effect produced by the addition of certain organic substances to a standard collodion, are of the highest practical importance. Photographers can now modify their collodion at all times to suit the varying nature of the objects they may wish to depict; or to meet the ever changing conditions of our too-variable climate.

While speaking of collodion, it may be remarked that the subject of "corrugated films" demands further investigation. The collodion alluded to by Mr. Crookes was found to be remarkably good, in this particular. Mr. Williams, the manufacturer, stated his belief that using the mixed acids at a temperature of about 160° Fahr. was important. The use of paper is also said to be preferable. The sort of iodide employed, too, does influence the result,—temperature alone not causing the discrepancies observed. Will those who have the leisure be good enough to experiment upon the above points?

Professor Frankland, F.R.S., has concluded the important and interesting course of lectures alluded to in our last number. The new matter and illustrations brought forward were fully appreciated by the learned auditory to whose critical judgment he appealed. The Royal Institution of Great Britain, in accepting these lectures, has done a great service to art. It is to be hoped artists and manufacturers will at once avail themselves of the suggestions and experiments regarding materials and their durability, now so distinctly offered them. Patrons and purchasers of works of art should insist that modern artists desist from the suicidal practice of using pigments (for example), which modern science, in supplying, warns us are inferior in durability to those employed by the ancients. In the discourse on photo-galvanography and photo-lithography, Professor Frankland stated his belief, that the chromic acid of the bichromate of potash yields oxygen to the gelatine in such a manner as to produce from it a a *resinous* body, which, naturally, would resist the action of water in Mr. Talbot's and Herr Pretsch's processes. This resin, formed wherever the light has acted, would, in Poitevin's photo-lithographic process have an affinity for the printer's ink,—damp gelatine having none: thus we can readily understand the *rationale* of those processes.

It is our intention to lay before our readers on a future occasion, the chief points of Professor Frankland's discourse on the "Atmospheric, Photal, and other influences concerned in the deterioration and destruction of works of art."

We have received from the St. Helen's Glass Works specimens of glass manufactured according to our wish, as expressed in our last number. We there omitted to observe what may not be known to the non-chemical reader, namely, that the so-called de-colorising of glass really effects, as far as oxide of iron is concerned, only a change from a blue to a *yellow* tint.

Albuminised glass is with us a great favorite; in sharpness of definition and vigour of effect we hold it to be superior to collodion, as hitherto manipulated. We believe its sensibility has been underrated. It is, therefore, with pleasure that we to-day give, through the kindness of Mr. Charles Chevalier, of Paris, the process of M. E. Bacot, who, in the presence of M. Arthur

Chevalier, obtained, in from twelve to fifteen seconds, with a half-plate apparatus, a negative of the *Fontaine Cuvier*, at Paris.

We welcome all intelligence respecting the formation or consolidation of societies established for the advancement of photography in all quarters of the globe. The *Journal* of the Bombay Society, has already furnished interesting passages to the past numbers of this *Journal*, and today we give some further instructive extracts.

The Belfast Photographic Society held a meeting on the 14th ultimo, when a series of rules for its government were adopted. To come nearer home, we announce with great satisfaction that the first meeting of the Chorlton Photographic Association was advertised to be held on the 11th inst., in the Committee Room, of the Town Hall, Chorlton-upon-Medlock. Professor Frankland, F.R.S., being the president, and T. Draffin, Esq., the honorary secretary.

We shall be glad to receive intelligence of the further progress of our provincial and continental brethren, not excluding by these designations the Sister Isle.

Protection of Photographs by Encaustic Paste.*—M. Belloc in his treatise remarks on the beauty which the positive print possesses while immersed in water, and which, as is well known, it loses considerably on drying. Varnishing, hot-pressing, and glazing by rollers are resorted to to restore the lost lustre and transparency, but varnish is generally too glittering in its result, and mechanical means are not always at hand. The *encaustic* of M. Clausel is, therefore, recommended as a substance which at once agreeably restores beauty to the proof, and aids in its preservation. It has been tried for several years, and prints coated with it have remained unchanged, while others in the same portfolio not so coated, have become spotted or sensibly faded. The encaustic is composed of Ceylon elemi dissolved in the best oil of lavender, and added to pure white wax also softened by oil of lavender, the addition of some oil of cloves completes the mixture. The proportions are not easily given, they are such as to yield a consistency resembling that of a firm pomade, which can yet easily be spread upon a paper surface, by means of the finger. It must be as firm as the manipulation during its use admits of. Although the materials are costly, the expense for each proof does not exceed a halfpenny. To apply it, the proof must be mounted on cardboard, or if for an album strained while damp. When dry and tense, take the encaustic upon the finger, and spread it equally, so as just to cover the paper, and leave it to set for five or ten minutes, according to the temperature. Then rub the surface with a folded up pad of woollen, (merino stuff answers best); leave it for a short time to further set or harden; and again rub it. Finally, in a few moments, when more hardened, finish the polishing with a fresh piece of merino, moved briskly, in order to get a uniform gloss. A little extra pressure will remove any smears arising from the presence of an excess of the paste.—*Les Quatres Branches de la Photographe, par a Belloc. Paris.*

* The fine pictures of M.M. Bisson are now sent out covered with an encaustic of the above nature.

LONDON PHOTOGRAPHIC SOCIETY.

At the ordinary meeting of this society, hel on the 4th instant, Sir W. J. Newton, vic president, occupied the chair, and after the usu preliminary business, communicated to t society an account of his exertions on beha of Mrs. Archer, as narrated in our address.

Mr. Hardwich then read a paper upon th influence of certain organic substances, whic may, with advantage, be added to a pure coll dion. Various "extractive matters" might b used, but he preferred the substance calle glycyrrhizine. This substance dissolved i alcohol, in the proportion of about five grain to the ounce, furnished photographers with solution which would enable them to obtai intense negatives from a collodion that, in it pure condition, yielded only pale, feeble pictures Its good effects would be especially seen i the copying of prints. Three or four drops c the solution should be added to each ounce c collodion shortly before using it. For portrait two drops might suffice. In dull weather it effect is not so marked, and therefore more ma be used without giving rise to harsh results The glycyrrhizine solution keeps for som months, and probably may be used in the bat instead of in the collodion. Mr. Hardwic prefers iodide of cadmium for iodizing the coll dion on account of its greater stability. Col lodion so iodized was used in the experiment with glycyrrhizine. In answer to a questio from Mr. Williams, he observed that he could, a present, add but very little to the account c the mode of preparation of glycyrrhizin which is to be found in the larger works o chemistry.

Mr. Crookes next read his paper on "*Th Albumen Process on Collodion*," which will b found in another page in full.

Mr. Williams attributed the absence of ret culation in his collodion, to which Mr. Crooke had referred, to the fact of his employing high temperature, about 160° Fahrenheit, durin the immersion of the paper in the mixed acids He would gladly contribute to the society an further information respecting the collodion wit which Mr. Crookes's experiments had been pe formed.

Mr. Shadbolt made some commendator remarks upon Mr. Crookes's paper, and trace the history of the processes in which doubl films are used.

Mr. Malone, while expressing his satisfactio at the efforts that were being made to establi the double film processes, doubted if the simp albumen film had been sufficiently tested again its competing rivals. He wished a compete tribunal could be had to direct attention to t best proved processes extant.

Mr. Shadbolt, in consequence of a remar made by Mr. Malone, maintained the accurac of a statement of his regarding Mr. Fox Talbot instantaneous process;

Upon which, Mr. Malone admitted that h spoke from memory only, but observed that th exact details of the process alluded to had nev been published. Mr. Malone, in conclusio promised to try and recover his notes of th process, as it was still of interest.

Mr. Rejlander gave a verbal explanation of ne of the means used in obtaining the fine nposition picture which he exhibited in the t Treasures collection at Manchester, and s warmly applauded.

After some further conversation, the meeting minated.

BOMBAY PHOTOGRAPHIC SOCIETY.

E have received the journal of this society the year 1856. From it we learn that the botype process, as practised by Mr. Buckle, s been most successfully employed in India, by ptain Biggs. "His productions—large views the Ruins of Beejapoor, 18 by 15 inches, and pies of inscriptions placed for exhibition by e local government—carried off the palm. ptain Biggs uses plain ammonio-nitrate paper his positives, and gives the final glaze by bishing the face of the picture first laid on a ite of glass, with a very smooth agate or corlian burnisher. This process not only gives e rich gloss so much admired by some in buminised paper, but serves to bring out ominently the fine half-tones and delicate tails of a picture without any risk of yellowg the whites, so liable to occur in albuminised per."

Mr. Crawford's wax paper views exhibited at e Bombay Photographic Exhibition, were enely successful, and quite free from the granular pearance often complained of.

With regard to the keeping qualities of coldion in India, W. B. W. writes that, at the tter end of 1854, he got out direct from London, me twenty ounces of collodion which was sent thout iodising solution. This collodion after ing put aside as worthless, was tried in the mmer of 1856, with iodising solution afterrds sent from England. It acted well and tter than some which was warranted to be resh and genuine." The collodion was in o-ounce bottles packed in tins filled with wdust, and was at the time of trial, about two ears old. It was kept in a common deal box ith other bottles, and was carried about at rious times in tents, and on journeys amountg to above a thousand miles.

ORIGIN OF THE COLLODION PROCESS.

By FRED. SCOTT ARCHER.

The process with collodion was originally given y me in the March number of the *Chemist*, 1851; d I had in a previous communication to the me journal made known the great power of yrogallic acid as a developing agent.

"Since their introduction, photography has ade most rapid strides towards perfection, rious improvements have been suggested in s manipulation, all tending towards the ultiate perfection of the process.

"It will be as well to say a few words in referce to the various experiments which led me adopt collodion as a medium, so well adapted r receiving the chemical agents necessary in is beautiful art.

"In my first account of the collodion process, alluded to the difficulties attending the use of aper, and described them as being too great ever to be overcome, on account of the unevenness of its texture and other defects.

"My first attempts with collodion were directed to the improvement of the surface of paper, by spreading over one side a thick solution of collodion.

"These essays were not successful, for, after the necessary washing, &c., in the process, the collodion film did not adhere to the paper sufficiently to be of any use.

"However, previous to and during the progress of these experiments, I was trying various other substances as media, for holding the chemical agents—zyloidin, other modifications of starch, extremely fine paper pulp, tanno gelatine solutions, and several combinations of albumen. Each had its turn, and it was only after innumerable experiments in various ways that I decided on collodion as being the best, and, at the same time, the most available substitute for paper. Its exceeding ease of manipulation, and the brilliancy of the pictures obtained with it, cannot fail to strike every one who sees them, and justifies me in the opinion I entertain of its value and practical importance.

"With regard to the introduction of collodion as the foundation of the process, I must say a few words.

"Collodion, there is no doubt, early attracted the attention of photographers, but who first actually suggested its use, we have no means of determining with any precision; since however its value as a photographic agent has been known and appreciated, many claimants have come forward anxious to obtain a share in the merit of its first introduction.

"There can be little doubt that many of those engaged in the pursuit of photography, anxious to improve the then known processes or invent others, would very soon have collodion brought under their notice, proceed to test its capabilities as a photographic agent, and possibly endeavour to work out a process by which it could be made available in the art.

"It is indeed obvious, from a consideration of its remarkable qualities, that it could not long escape their observation, and we may easily imagine also that it would be likely to attract simultaneously the attention of many parties who were labouring in the same field of research.

"It is evident that, in deciding a question of this kind, the *first published account* must take precedence of any other kind of proof, and it is due to M. Gustavus le Gray, a gentleman whose great services in other branches of the art of photography are well known, and are held in high regard, to say that he was the first to publish an account of collodion as a photographic agent. I allude to his pamphlet published in 1850, wherein he mentions collodion and its *possible* use. His first application of it appears to have been as an encollage for paper. Afterwards he used it on glass, and gave in his memoir a short account of his researches, but no manipulation in detail was made known, such as would entitle it be called a photographic process; and from the wording of his published notice, it would appear to have been merely an extract from his note book of chemical experiments; as such it attracted little attention at

the time; still M. le Gray must be considered the first party who, by publication, made known his researches on the subject, and although this notice did not lead to its practical use, it establishes his claim to be considered the first to suggest its value in photography.

"About the month of June, 1849, I began to turn my attention to collodion as a substitute for paper, with the hope that by its means a surer and more delicate medium might be produced to work upon than paper was ever likely to be.

"I tried numberless experiments with it, and varied the mode of using collodion, with the hope of getting at a practicable and sure method of working it.

"These experiments were carried on until the month of March, 1851, when I published in the *Chemist* a short account of my experience in the matter; giving a process in detail,— the mode of preparing collodion with iodide of potassium and silver—the proper strength of the nitrate of silver bath—the best proportion of pyrogallic acid for developing the latent picture, with the manner of fixing the picture produced; in fact, giving the whole of the process in detail.

"It will therefore be evident, that although M. le Gray has the merit of having been the first to make known this valuable photographic agent, still as he did not, at the time of his publication, produce it as a process with the necessary details to make it intelligible to the photographer, his claim must in consequence be limited, and cannot in justice interfere with the merit of another party, who from his own experience, made known a process with collodion, and that *without any assistance* from, or reference to, the labours of others in the same field of research."

THE ALBUMEN PROCESS ON COLLODION.

By William Crookes.

Although I intend to give a description of one particular process which I have now employed for nearly six months, and in which I have met with far more uniform and certain success than in any of the other dry processes on glass, yet the photographic and chemical manipulations which will have to be described, and the new pieces of apparatus which I shall bring before your notice, will be found useful in many of the operations of photography, especially in the numerous methods of preserving the sensitiveness of collodion plates, which are now attracting much attention. I am also the more induced to address you this evening as it is the last meeting for some months, and although I do not anticipate that photographers will give up any process in which they have acquired dexterity and a moderate hope of success, for one, which, coming so late in the season, leaves them very little time for obtaining the necessary facility to ensure good results; yet I still hope that they may find a few of the hints herein contained useful in the approaching vacation, whilst possibly some photographer, not yet wedded to any particular process, may be tempted to follow my instructions more closely.

I have called it the albumen process on collodion, because, whilst I started originally with Taupenot's process, taught me by its excellent popularizer, Mr. Ackland, I have gone on simplifying and, as I fancy, improving, until th distinctive features of the original method ar lost, and it becomes little more than the o albumen process.

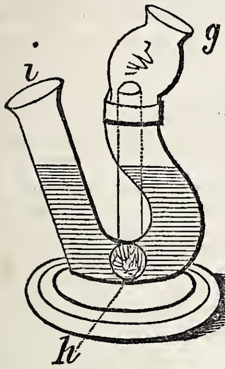
Instead of employing the collodion film as photographic agent, and performing a doub system of iodizing, exciting, and washing, consider the collodion as merely a mechanic agent, affording, on its newly-formed and de cate surface, an infinitely purer support for th albumen film than the most scrupulous cleaned glass.

A plentiful supply of water is indispensable nearly every stage of the process, and whe this is not ready laid on, a covenient substitu may be made by placing a two-gallon sto bottle near the operating bench, and standi on a shelf a little distance above the worki level; into the mouth a cork is loosely fitte having two glass tubes going through it, o passing to the bottom and projecting a fe inches through the cork to allow of a piece vulcanized india-rubber tube being slipped ov the end, and the other merely passing throu the cork to allow of the ingress of air. To t other end of the india-rubber tube a tap with rather narrow orifice ($\frac{1}{4}$ inch) is attached, whi may be either fixed immoveably to a support the proper height, or be made capable of mo ing to different parts of the bench; by applyi the mouth to the tap, and sucking the air o of the long tube, the water in the bottle will drawn over the bend, and the arrangeme then being that of a siphon, the water will ready to flow from the tap so long as any mains in the bottle. Underneath the tap the should be a sink, or a large dish with a pail a siphon tube under it, and in this the levelli stand must be placed. As the developme takes some hours, I have a stand which adm of several plates being placed side by side; consists of two parallel rods of brass, 18 inc long, and 5 apart, five points projecting wards from one of the rods, and five *pairs* points (about $2\frac{1}{2}$ inches apart) projecting fr the other rod: the tips of these points must in the same plane; the whole is bound toget by suitable frame-work, and supported on lev ling screws as usual.

For pouring on the collodion I prefer one the tall, narrow bottles usually employed such a purpose; but for the albumen mixtu owing to the extreme difficulty of avoiding bubbles and froth, and of getting them off plate when once they have accidentally flow on with the liquid, an ordinary bottle is applicable. I have devised a little glass strument which answers the purpose m admirably, and as it filters the solution time of using, the froth and dust or floa specks are entirely got rid of at the same ti It consists of a glass tube, bent as at g, i; i the bottom a piece of fine damp sponge (h pressed, completely filling up the bore of tube for about $\frac{3}{4}$ of an inch of its length, sufficiently tight to act as a filter for all floa particles, and at the same time to allow liquid to pass through tolerably freely.

Any solution poured into the mouth (g) of instrument will at once flow through the spo (h) until it has attained the same level in e

;; in using, care must be taken always to pour m the end *i*, and to return the solution through by this means it will be filtered each time.



This simple and inexpensive piece of appatus, which any instrument-maker or glassower can supply at a few hours notice, will be und invaluable in almost every photographic ocess on glass. The sponge has this great adıntage over all other kinds of filters, that thick utinous liquids, *e. g.* honey, albumen, gelatine, etagelatine, or the various preservative syrups, ıw through it with the utmost readiness, whilst the same time, dust, air-bubbles, or froth, ıd dried particles floating in the liquid are fectually kept back. By a very slight modifi-tion in the form, stoppers might be ground to it, and then it could be used for collodion. I have also contrived a very convenient box r storing the sensitive plates, which keeps em perfectly light tight even in the sun, and the same time is less bulky than the ordinary ooden ones. It is made of tin plate, the cover iding tight over the top, and more than halfay down the sides; light is further prevented om access by means of an outward jacket of n, which is soldered to the box a little below ıe centre. The cover thus slides between the ıse and jacket, and renders injury to the plates om the entrance of light an absolute imossibility.

Before these boxes are used, they should be ell scrubbed, especially in the corners, with ap and hot water, then well rinsed with water, nd afterwards with pure alcohol, and allowed dry spontaneously; a cover of blotting-paper eing put over the mouth while drying to keep ut dust.

The collodion employed should be very thin nd fluid, and the film should be of that short, owdery character which is obtained by employıg hot acids in making the pyroxiline; it should ot set in ridges or network recticulations on ıe surface, but ought to be as smooth and clear s glass: provided these conditions are fulfilled, matters little what collodion be used, old or ew, iodized or uniodized; the latter is what I sually employ, diluting it first with the proper uantity of alcohol.

The same precautions against floating specks ı the collodion, or dried particles round the eck of the bottle, must be taken as in the case f the moist collodion process.*

* I have obtained good results with almost every collodion ied, but there is one which for this process is so pre-eminently uperior to any other, that to pass it over unmentioned would be nfair both to my audience and to the makers, Messrs. Hopkin nd Williams.

The albumen mixture is made in the following manner:—Take the whites of three or four eggs, carefully separated from the yolk and white stringy particles, and put them in a bottle capable of holding about double the quantity; now add to each ounce of albumen about two drops of glacial acetic acid, put in about a teaspoonful of well washed coarse sand or bits of broken glass, and closing the mouth of the bottle with the thumb, shake the whole violently for a minute or two. In about half an hour strain through muslin, then filter through a funnel which has a piece of fine damp sponge pressed loosely into the neck, and add one or two pieces of camphor about the size of a pea.

Next prepare some of Maxwell Lyte's solution of metagelatine in the following way:—Place half an ounce of fine white isinglass in a clean Florence flask, and dissolve it in three ounces of distilled water; hasten solution by means of a gentle heat, and when dissolved, boil it violently with a gas or spirit-lamp for a minute; then add a mixture of 20 minims of oil of vitriol and 1 ounce of distilled water, and boil again violently for five minutes; allow it to cool, and then boil it a third time for five minutes, and repeat the boiling and cooling until it no longer sets on cooling (it will probably require this to be repeated about twice after adding the acid). During the last time it is being heated, add to it precipitated carbonate of baryta until the sulphuric acid is neutralized, which will be known by all effervescence ceasing (the quantity required will be rather less than 80 grains of the pure carbonate). Now add water to make up the bulk to 4 ounces, strain through muslin, and when tolerably cool, add about ½ a drachm of albumen prepared as above; shake up well and heat once more to the boiling-point, and the albumen in coagulating will be found to have carried down with it the whole of the finely divided floating sulphate of baryta, and the liquid will now filter with the greatest ease and rapidity through filtering paper.

To prepare the iodized albumen solution, take

Prepared albumen...........	1 fluid ounce
Solution of metagelatine ...	1 „ „
Distilled water	2 „ „
Iodide of calcium	...12 grains.

Mix these together and filter through blotting paper until quite clear, and then preserve in a well-*corked* bottle with a few grains of camphor, until required for use. It will keep good, in a cool place, for two months at least, and in all probability much longer.

I have taken excellent and clean pictures when the plates of glass were actually dirty, being covered with smeary-finger marks; and although I do not think I have traced many stains to this cause, yet as no true photographer would ever knowingly employ dirty glasses, I need hardly say, clean them thoroughly. Each experimentalist has a way of his own by which the plates are supposed to become cleaner than by any other method; I would not recommend any alteration to be made, as really less care is necessary than for the collodion process. Plates which have been previously used for this process may require to be soaked for a few hours in a dish or pail con-

taining a strong solution of common soda, before the hardened albumen is loosened sufficiently to come off. If it be very refractory, recourse may be had to a hard nail-brush, which will always be found irresistible.

After the glass plate has been cleaned, it must be coated with collodion in the usual manner, and then, after allowing it to set for a second or two longer than the ordinary time, laid face upwards in a flat dish of water (not necessarily distilled).

When it has remained there a minute at least, and as much longer as convenient, it is to be taken out, held sloping under the tap, and have a thin stream of water flow gently over the face, in order to wash away any slight greasiness from alcohol still remaining on the surface, and also to remove anything which might have settled on the surface whilst in the water. It is then to be stood up sloping and face inwards against a perpendicular board or wall to drain, one corner resting on two or three folds of clean blotting-paper, and the opposite corner resting against the board perpendicularly over the lower one; the plate thus touching by two points only. As soon as it has drained for half a minute, take it by one corner, wipe the back dry with blotting-paper and pour about an ounce and a half of iodized albumen solution into the mouth (*g*) of the glass pourer described above. Pour the iodized solution from the end (*i*) of the pourer on to the (formerly) upper end of the plate; allow it to flow over the surface, driving the water before it until it gets to the corner which was lowest, where pour it back into end *(i)* of the pourer; repeat this once or twice, or until any specks or bubbles which may be seen on the plate are washed off. When coated, stand the plate either against the wall in a corner, or what is much better in this case, in a light wooden frame, where the bottom edge rests at two points on strips of blotting-paper, covering the rods, and held with its face sloping downwards by pieces projecting from the upper rod, and supporting the plate by the centre of its upper edge: the whole stands on four legs so as to admit of a free current of air. By this means the plates dry regularly and evenly, whilst no dust is likely to settle on the surfaces, especially if they be placed in an unfrequented part of the room; they will be dry in two or three hours, and may then be rendered sensitive, or preserved for future use in boxes: they will keep in this stage for an indefinite time.

I usually prepare twelve plates at a time, and by a little care to dovetail the successive operations one with the other, that number can be prepared ready to be made sensitive in little more than half an hour; this latter operation occupies not more than a couple of minutes for each plate, but as the iodized plates must be used dry, they cannot be excited immediately after the iodizing.

The sensitizing bath consists of the ordinary 30-grain solution of *fused* nitrate of silver, saturated in the usual way with iodide, and containing ½ an ounce of glacial acetic acid and ½ ounce of alcohol to every 8 ounces of solution; (an ordinary collodion bath will do, if it have the above proportion of acetic acid added to it.) It will become discoloured by use, but this may be disregarded until it has beco[...] almost as dark as port wine, when some kao[...] shaken up with it will remove the colour, a[...] after filtering it will be as good as at first.

Up to this point all the operations may [...] performed by daylight. Just before the iodiz[...] plate is made sensitive, it must be sligh[...] warmed before a fire or over a spirit-lamp, [...] drive off the moisture from the surface, a[...] then, the room being darkened, it is to [...] immersed in the silver bath in a similar way [...] a collodion plate. After remaining there [...] about a minute, hold it under the tap and wa[...] all the silver solution from the plate, back a[...] front. It is not necessary that this wat[...] should be distilled, ordinary water such [...] London is supplied with will answer perfectl[...] If, however, it should happen that the washi[...] water contains a very large quantity of ext[...]neous matter, it will be as well to rinse t[...] plates, after washing, with some purer wat[...] or the salts being deposited on the surface [...] the water evaporates might give rise to spo[...] and stains; then stand up to drain on cle[...] blotting-paper in the way recommended aft[...] iodizing. Artificial heat may now be used [...] dry the plates, but it will be safer to wait t[...] the water has evaporated spontaneously; th[...] will now be ready to be stored away in lig[...] tight boxes for use at a future time.

The length of time which these plates w[...] keep, depends more upon the care and fo[...] thought which has been bestowed upon th[...] packing, than upon any inherent principle [...] decomposition which they contain; thus, in [...] ordinary deal plate-box, I have found th[...] slightly fogged at the end of a week or t[...] days, whilst in a clean tin box, such as I ha[...] above described, there seems to be no limit [...] their keeping property.

The sensitive film has quite a different a[...]pearance to that of collodion, being perfec[...] transparent, and of a hard horn-like surfa[...] bearing tolerable hard friction without injury[...]

Regulating the time of exposure is, as in eve[...] other process, entirely a question of experie[...] to decide. I find the best results are genera[...] obtained by exposing about five or six times [...] long as tolerably sensitive wet collodion wo[...] require; but it may vary within very wide lim[...] without much injury to the picture.

Better pictures are obtained by rather o[...] than under exposing: in the latter case, t[...] detail in the faintly illuminated parts will [...] entirely lost, whilst the only ill effect of t[...] former plan will be a slight excess of half-ti[...] and by careful development even this may b[...] a great measure avoided.

To develope, I prepare the two follow[...] solutions, each of which will keep good for [...] indefinite time:—

Gallic acid	100	grains
Alcohol	2½	ounces
Water	2½	„
Nitrate of silver	100	grains
Glacial acetic acid	2	ounces
Water	16	„

Mix together in a Berlin porcelain dish o[...] hemispherical form, (which must be first scru[...]lously cleaned with strong nitric acid, appl[...] hot if necessary,) equal parts of these two so[...]

s, and having previously wetted the surface he plate drain it well, and pour the above ture off and on several times, and then let it on the surface of the plate, which must be ported on the levelling-stand.

he development is rather slow, especially if temperature of the room is lower than 60° r.; the picture will not sometimes com- ce to appear for the first quarter of an hour, may take four or five hours before the ation is completed; more frequently, how- , if the exposure has been correct, an hour a half will suffice.

stains appear during the development pour solution off, and holding the plate under a stream of water, gently rub the surface a large camel-hair pencil; this will gene- remove every particle of the stain, whilst ill in no way injure the surface of the plate he development of the picture; if the deve- ng solution has kept tolerably colourless, it be poured back again, but otherwise a fresh tion must be made. If, also, the develop- t be very slow, owing either to the low perature of the room or a too short exposure, solution may be poured into the porcelain and gently warmed with a spirit-lamp be- pouring it back. Fresh developing solution t be made as soon as the former has become oloured, and previous to pouring it on, the ace of the picture must be well rubbed with brush as above described.

must be distinctly understood that these ous operations are only necessary under cir- stances in which the picture by any other cess would have been lost at once. The e may contain a subject which it would ery difficult or impossible to obtain a second , and the operator must judge whether a ative be worth the extra trouble. In ninety- cases out of a hundred nothing more will eeded than to pour the solution on and let it ain there until the picture is developed.

When sufficiently developed, the plate must well washed; and, according to convenience, may be dried and preserved for fixing at a re time (of course in darkness); or this ration may be performed at once by means yposulphite of soda and copious washing, in usual way.

fter drying the plate will be finished; no nishing will be required, as the albumen sur- is sufficiently hard to resist any violence to ich a negative ought to be subjected.

he great objection to similar processes, such he albumen and Taupenot's, is the liability he surface to rise in blisters during the ex- ng and subsequent development. This is sed, according to my experience, either by mersing the iodized albumen plates in a htly damp condition into the silver bath, or employing the collodion or iodized albumen not sufficiently thin, dilute state. Know- this, I am now never troubled with these noyances.

have employed the foregoing process very cessfully in printing transparent glass stereo- pic slides. In this case the operations must performed on the rough side of the finest ound glass, (not *clear* glass purposely ground, patent plate, one side of which is left in the last stage before the final polish is given to it.) That some such arrangement as this is neces- sary, will be seen on a moment's consideration: the positive, printed by superposition, must be viewed with the picture-surface next the eye, or the sides will be untrue to nature; it must consequently have the protecting glass mount in front of it. Were it printed on the clear side of ground glass, the rough outer side would be very liable both to contract dirt, and also, from frequent handling, to be stained with transpa- rent grease marks difficult to remove. I believe the glass stereoscopic slides usually met with have the glass clear on both sides, and the picture is afterwards coated with a kind of semi- opaque varnish, such as wax in alcohol. This plan is very good, but the one I propose is equally effective and less troublesome.

The dimmed side of the plate is prepared and rendered sensitive absolutely in the same way as before described. When perfectly dry, the face of the negative and the sensitive side of the plate must be placed in contact, and the two pressed together in a pressure-frame. If this be of the ordinary construction, a piece of opaque card or paper must be placed between the negative and the front glass of the frame, overlapping for some inches on all sides, and having two holes cut in it the size of each pic- ture, similar to a mount. The object of this is to prevent light from getting access to the sen- sitive plate at the sides; if it does so, not only will the plate darken at the edges, but the light being reflected from surface to surface internally along the glass, will extend its fogging influ- ence nearly to the centre.

An exposure of a few seconds to diffused day- light, or a few minutes to the light of a mode- rator lamp, three inches from the globe (in this case one side must be exposed at a time, the other remaining covered), will, with ordinary negatives, be ample; the development, &c. may be performed in the above-described manner.

RELATIONS OF SCIENCE TO ART:

Optical, Atmospheric and Photographic Inquiry.

The true relations of photography to vision and to art-delineation are not generally so well understood as they deserve to be. Artist- readers who are photographers, and, moreover, close observers of atmospheric phenomena, will like to have their attention called to the inquiry from a correspondent in *Notes and Queries*, who signs himself "Henri." He gives the above triple title to his inquiry, because:—"with re- ference to the first two mentioned, there are differences of opinion as to whether the one or the other be the cause of a certain phenomenon between myself and a friend; and with regard to the last, because seeing a photographic print, the subject was started between us. The pho- tograph in question was a very beautiful one of Salisbury Cathedral; the exterior taken from some little distance, and, of course, giving the whole building. It was noticed by my friend that the upper part of the spire was darker than the lower, and he raised this query, 'whether it was caused by an optical or an atmospheric effect?' I said optical; he said atmospheric; and an appeal was made to two or three gentle- men present, one of whom, by the way, was a

Cambridge wrangler, and had, I presume, made optics his study; but they all, I think, appeared to side with my friend, that the *atmosphere* was mainly the cause of the phenomenon. I still maintained my opinion, and mentioned as my authority, Sir Charles Bell, who wrote on the subject in one of the Bridgewater Treatises, I believe. As well as I can remember Sir Charles Bell said the effect was caused by a great portion of the retina of the eye being opposed to the light from the sky, and that when the eye is moved to look at particular portions of the steeple, the reflected light from the steeple falls upon the retina where it (the retina) is exhausted by the direct and more powerful light from the sky. He then went on to say, that if we look at a steeple and drop the eye to examine the lower portion of it, the upper part infallibly is darker; and this, while I am writing, I prove to be correct, for I am looking at the spire of St. Michael's Church in this city. In fact, from what Sir Charles Bell says, I have always considered it an optical effect, and caused by an exhaustion of the sensibility of the nerve of the eye and not by contrast. I then urged that I believed a camera as used by photographers was a kind of artificial eye, (errors arise from this parallel), and probably would give the same effect, or, I should say, receive the same as the natural eye. My friend still held his opinion that it is an atmospheric effect alone, and he thought it arose from the atmosphere being more opaque as it gets higher from the earth. Certainly a camera cannot have the movement of the natural eye, and from Sir Charles Bell's description it appears the effect is partly caused by the eye moving from part to part of the object."

To this H. C. K., —— Rectory, Hereford, replies that it is well known that a spire is ordinarily less illumined towards its upper portion than at its middle and base; and that it is not an optical illusion, nor due to atmospheric absorption; and states that "the lower two-thirds of the spire or tower will ordinarily be decidedly in light, and the upper third as decidedly in shadow;" and in conclusion writes:—"The true cause of the phenomenon is this. It will be found that it is only on a bright or at least a moderately bright day that it is seen at all. On a dark day the tower will present a uniform tint, on a bright day, the light which illumines the tower will of course not be diffused light alone, but will proceed from the neighbourhood of the sun, and therefore will strike the tower, and be reflected thence to the eye of the spectator *at a particular angle*, which angle will of course vary with the hour of the day. A little consideration will show that at the elevation from which a tower or spire is ordinarily seen, the full light which impinges on the upper part will be reflected over the head of the spectator, and cannot therefore reach his eye; while for the same simple reason if the eye, preserving the same horizontal distance from the lower as before, be elevated so as to view it a little below the level of the top, the upper two-thirds will be in full light and the lower one-third in comparative shadow."

We shall be glad if the insertion of this leads to further experiments and observations.

EXHIBITION OF ART TREASURES A MANCHESTER.

The continued want of catalogues, and t apparent absence of systematic arrangeme constrain us rather to generalize in our rema upon the Photographic portion of this exhi tion, and to endeavour to examine the differ classes of photography as represented the instead of proceeding in regular order throu the collection. At the outset we are surpri by a striking omission, viz.:—the non-represe tation of direct photography, meaning there positive and negative pictures on glass paper as produced *in* the camera; all that see here are the result of a subsequent proce and no means are afforded to the photograp student, of tracing the progressive st by which the results before him have b attained. In nearly every case it is left to t visitors' experience to determine whether picture is from a collodion or albumen negati or both, or from waxed paper, or by any of numerous preservative formulæ, and the origi negatives themselves are nowhere visil Photographic art may be divided into almost many classes as the art of painting itself. propose to notice some of its divisions. T department to which professional photograph mostly devote themselves is portraiture, a this class, judging from the large number touched portraits here exhibited, would seem be greatly dependent on the painter's adve tions aid. In some cases no trace of the origi picture is visible, its only use apparently be to secure identity and truth, the visible pict being laid over the other in oil or water co Messrs. Caldesi & Co.'s portraits of Md Piccolomini, Sir B. Hall, Signor Mario, a others, are among the best specimens of t class; but, for the reasons we have alluded we consider them rather out of the pale of criticism. We wish to see photography tramelled by the easel, and however beaut the results may be, we think that colorec stippled photographs should be exhibited such, and not allowed to shame their m modest fellows by their glaring propinqu There are, however, some very pleasing touched portraits, the names of the artist which are not known to us. To these, as to other omissions, we must again recur. So taken apparently at very short distance wit large lens, appear to us particularly disag able. They are by Mr. Herbert Fry, we belie Among them we may mention those of L Palmerston and Mr. Gordon Cumming; dis tion is painfully visible in these, and as ph graphy cannot flatter, we think at all ev possible exaggeration ought to be avoi There are a few good vignetted portrait Mr. Delamotte, Mr. Brothers and other arti among which we may refer to that of J. Wa Esq., Mayor of Manchester; we object, h ever, to the yellow tint of the paper in this c In this class also, we may refer to some v interesting pictures of patients in various sta of lunacy, placed in the north gallery. entirely disagree with the writer in the *M chester Examiner and Times*, who complainec their exhibition, and we think anything wh

in ;ases our knowledge of the condition of the ur ppy beings who are stricken in mind may fa y be counted among the useful agents for th amelioration of that condition. The next m erous class, namely, landscape photography, is shared with worthy emulation between a teurs and professionals. Many of the pro- d ions of this style are of high artistic ex- ce nce, and are fine exponents of the capabili- ti of the art. Among these, to Mr. Leverett's w ed paper pictures 523 and 526, may be a rded the first place, and we can scarcely h e anything more exquisite than Messrs. D more and Bullock's "Hampstead Heath," and th "Old Mill at Ambleside." And as good s imens of the early style of the art Mr. B. B. Turner's talbotype pictures may be re- fe ed to. One of them called "Photographic T th" depicts a country church, both in the p tion of reality, and also the inverted reflec- ti in a pond, with so much veri-similitude, th the early matin goer must needs beware. M White's well known favourites are good sp imens of landscape photography. There is al one of Messrs. Mudd's best pictures, "A S ne at Tifriw," so good that we cannot help re etting that no more of theirs are to be found in he collection. We ought not to pass over th matchless sea and sky pictures by Mr. Le G y and others.

his class admits of further subdivision which w bring under our notice architectural pho- to raphy, in which Messrs. Baldus and Bisson F res stand first and foremost. We next come to he copyists, a class of which every art shews n erous examples, though none so literally as photography, and the very matter of fact cl racter of this class constitutes its chief value; a otable instance of which may be alluded to— th collection of gems of this Exhibition which M ssrs. Colnaghi are publishing, which will e ble many to possess what would otherwise h e been unattainable. We hope that every c e will be taken to use the best possible paper a l light for this work, as the specimens we h e seen, for instance the copy of Mr. Frost's p ture of Una and the Wood Nymphs, seem r her deficient in these respects. Of this class t copies of pictures in this year's exhibition the Royal Academy by Messrs. Howlett may b cited, and we may here notice the in- a lity of pictorial art critics thoroughly to u lerstand the feeling of photographers. For e mple, the *Art Journal* speaking of the Royal A ademy says, of No. 92, "The Photographer," (ere is here a copy of it,) "The deficiency of t picture is that we cannot see a subject of i erest sufficient to engage the attention of the p otographer." We would ask whether painting photography produces the most artistic picture m the same material however inauspicious, a l if photography loses the award we say with t *Art Journal*, "Photography has done much art in the smaller works: it is recognisable e erywhere in small landscapes and small figure p tures." Then of No. 28, the same critic says:— This picture has much the appearance of having b en painted from a photograph, but it surpasses p otography because the detail of the shaded p rtions is as perfect as that of the light passage." bad standard of photography was evidently present to the critic's eye, for who would pro- nounce as good, a photograph deficient in this respect? We do not pretend to notice every class into which photography may be divided, but we must not pass over in silence the artists of *genre*, who are not numerously, though well represented here. This class delights in subjects of allegory or imagination, and while we are bound to confess our own belief that these sub- jects are rather beyond the capabilities of photo- graphy, we cannot keep back a meed of praise from the works of Balders, Lake Price and Rej- lander. This latter gentleman will readily under- stand why we prefer his earlier works, such as "Don't Cry, Mamma." "Barnaby Happy," and the "Scholar's Mate," &c., to those which he now exhibits. The best of these is that of the Cherubs from the picture of the "Maddona del Sisto;" this is done from the life, and though the angels are rather too much "of the earth, earthy," still there is a fine poetic feeling evident in the composition. A more ambitious picture is that of "Youth and Age," exhibiting extraordinary ingenuity and skill, being printed from some thirty negatives: the picture has many good points, but falls somewhat short of our idea of what allegory, as delineated, ought to be. As an instance of this in a really artistic view, let us refer to Mr. Maclise's fine picture of the "Spirit of Chivalry," rightly placed in a pro- minent position in the water colour gallery. The enumeration of this class detains us not long, for after viewing some more of Rejlander's fancies, and some fine groups of armour and articles of *virtu* by Balders, and Mr. Price's "Don Quixote," we have done. This last is really a fine composition, and whether we regard the arrangement of the material or the conception of the errant knight, or the praise- worthy points of the photograph, we are bound to contribute our mite to the praise which this work has received. We wish that its repro- duction by the Photo-galvanographic Company could be made to equal the original, which we see here for the first time. We can only spare space to regret that we still labour under the restrictions referred to in our last. Σ

SOLAR PHENOMENA.

[Concluded from page 117.]

"Sir William Herschel first proved that diffe- rent parts of the prismatic spectrum exhibited different thermic powers. By thermometric examination Herschel and Englefield found, that whereas *quite out of visible light*, beyond the confines of the red ray, the thermometer rose, in two and a half seconds, 18°, it rose in the same time, 16° in the red ray, 6° in the yellow, and but 1° in the blue, no change whatever being produced in the violet. From this it is at once apparent, that the illuminating and heating maxima are not coincident, and that the refran- gibility of light and heat are different. Sir John Herschel has still more convincingly proved this in the following manner:—

"'The thinnest post paper, such as is sold for foreign correspondence, was stretched on a frame. One side of this paper was blackened with Indian ink, or, which is better, smoked in the flame of oil of turpentine, or over a smoky candle, by drawing it often and quickly through the flame, giving it time to cool between each exposure, till it is coated on the

under side with a film of deposited black, as nearly uniform as possible. The white side of the spectrum is exposed to the incident spectrum, properly adjusted; keeping the blackened side hollow to admit air and to avoid rubbing off the black coat. A fiducial dot being made on it, and this brought to coincide with the standard yellow ray, a flat brush, equal in breadth to the paper, dipped in good rectified spirits of wine, is to be passed over the white surface till the paper is completely saturated, which will be indicated by its acquiring a uniform blackness in place of the white it at first exhibited. After a few minutes a whitish spot begins to appear, considerably below the extreme red of the luminous spectrum, which increases in breadth until it equals the breadth of the luminous spectrum, and extends moreover within it, up to and beyond the fiducial yellow. In this state, and just as the general drying of the paper begins by whitening the whole surface to confuse the appearances, a second, sudden, and copious wash of alcohol, from above downwards, must be applied without disturbing the spectrum, or in any way shaking the apparatus. The superfluous alcohol will have hardly run off when the phenomena of the thermic spectrum will begin to appear in all their characters; at first, faintly, and as it were, sketched in by a dimness and dulness of the otherwise shining and reflecting surface of the wetted paper; but this is speedily exchanged for a perfect whiteness, marking, by a clear and sharp outline, the lateral extent of the calorific rays, and by due gradations of intensity, in a longitudinal direction, their law or scale of distribution, both within and without the luminous spectrum.'

"By this method it is proved that calorific rays exist most extensively, unassociated with light."

The chemical action of the sun's rays next receives attention. After stating that sun-drawn pictures are the result of "radiations which have no luminous power" or calorific principle, Mr. Hunt directs attention to the following "fundamental experiment:—"

"The prismatic spectrum, as already described, with its chromatic bands, is made to fall upon a screen covered with chloride of silver. The paper spread with this salt is perfectly white, but if exposed for a few minutes to sunshine it is changed to a deep chocolate colour, which gradually passes on to an olive-brown. We have before assumed that our little flame-like band of coloured light is an inch in length; we will preserve it the same in this experiment. Under the influence of the spectrum the white paper begins to darken, but not where there is the most *light*. The change first appears upon that part on which the blue and indigo rays fall, and where, within the spectrum, there is the *least light*, there is the greatest chemical action. In the violet ray the action is not quite so intense, and in this ray there is a little increase of light, from the blending of the secondary red ray with the blue. If the experiment is very carefully tried, a slight line remains unchanged under that spot on which the *lavender* rays fall, but beyond this point, where there is no light to be detected, chemical action progresses with great uniformity over a space equal to three-quarters of an inch or more. At the other end of the spectrum the result is different; from the blue ray down through the green the paper darkens, but the darkening regularly diminishes, until at the edge of the yellow ray, which is the maximum of luminous power, it is sharply stopped; and during a prolonged exposure under the greatest intensity of solar illumination, the space covered by the yellow band is preser unchanged. In the orange ray, chemical act sometimes, but not always, begins again; through the space occupied by the ordinary ray, a small change of colour (frequently t red) takes place, but over the space occupied the *crimson*, or extreme *red ray*, not the sligh evidence of chemical action is to be detec While these changes are going on, the diffu light which always accompanies the spect is slowly altering the colour of the whole of prepared surface; but upon examining it, spaces will be found preserved from this in ence, and these will exactly correspond those points where light and heat are at t maximum intensity.

"The chemical action appears most energ upon the space marked by the blue rays. John Herschel, by an arrangement of prisms, threw the yellow rays of one upon the blue rays of another, and the result was, entire suspension of the actinic energy of rays of this part—paper spread over with c ride of silver remaining unchanged under combined actions of these radiations. An perimentof Mr. Robert Hunt's appears, howe to be still more conclusive. Glass stained a yellow by oxide of silver, has the power of s ping the actinic principle, as will presently more fully explained. A piece of this glass interposed between the prism and the scree slight alteration was produced in the ble bands of colour, but the primary rays, yellow, and blue, were well defined. T were allowed to fall upon a piece of paper, pared in such a manner as to be very susc ble of chemical change. No alteration, howe took place. A mirror was now adjusted at an angle that a full flood of sunshine was flected upon the paper, the consequence b that it darkened to a deep brown, in a seconds, over every part of the paper excep the line upon which the *luminous spectrum* this was preserved white and unchan throughout its entire length. The blue rays been commonly spoken of in chemical trea as peculiarly the chemical rays, but in the a experiment we have them existing without power of producing decomposition."—*R rt Hunt, in the British Quarterly Review, No. XV.*

ALBUMINISED GLASS.

By M. E. Bacot.

M. Bacot is convinced that anyone who ll follow his directions may most certainly o in a fine negative upon every plate used, nd although the process does not possess he rapidity of collodion, a portrait has been b-tained by it in the shade in from 30 45 seconds, using a whole plate apparatu of Chevalier's construction. M. Regnault has already presented to the Academy of Sci es at Paris instantaneous pictures of the wav of the sea also obtained by this method.

The first important thing is the cleani of the glasses. The plates should be finish by rubbing them over with alcohol applied b an old linen cloth, then, by means of a large nd very clean camel hair brush, all dust and res are removed: the room in which this oper ion is carried on should be well cleaned out be re-

, and all currents of air avoided, for every spot will cause a stain. Take the whites of gs freed from the germ, and put them in a basin; then into a porcelain (or earthen-) pipkin; put of

Distilled water	45	grammes*
Dextrine	9	„
Iodide of potassium	3	„
Bromide of potassium	5	decigrms.

lve the dextrine by the heat of a lamp, ve the vessel, and add the iodide and ide of potassium; let the mixture cool a , and then strain it into the white of egg, ng the whole into froth: in twelve hours wards, the albumen will re-liquify and is for use. To apply it to the glass, have , perfectly level, a piece of board smaller the glass; now remove all dust by means brush, and place the glass on the levelled l: then pour upon the centre of the glass, lbumen mixture; (from Mr. Crookes's tube) just enough to cover the glass, for if more oured it will, much of it, be lost, and by a practice the right quantity may be applied. ld the albumen not spread evenly, move late to and fro, and finish by guiding the carefully with a piece of paper; let any s be dripped away at the four corners ssively, taking care that any back flow be equalised in the centre of the plate: the plate on a level board to dry free from

When dry, put the plates in a box to rve them till wanted. Just before making late sensitive, (we detest the word *sensi*-,) submit the albuminised glass to the ur of iodine until it is of a fine golden w colour, then plunge it, in a darkened , into aceto-nitrate of silver thus composed:

Distilled water	280	grammes
Nitrate of silver	32	„
Glacial acetic acid	80	„

two minutes of immersion the glass is lrawn and perfectly washed in distilled r; if it is to be used dry, the water must hanged two or three times. After the sure in the camera, warm gently the following mixture made in sufficient quantity to cover late when placed in a dish:—

Distilled water	400	grammes
Gallic acid	7	„
Acetate of lime	3	„

the warm liquid into the dish, and plunge it the plate, and as soon as all is cool, add drops of aceto-nitrate made with

Distilled water	100	grammes
Nitrate of silver	6	„
Acetic acid	20	„

n the picture is well developed, wash and n a solution containing ten per cent. of sulphite of soda; again wash and leave to by placing the plate upon *one* of its angles. this process the picture of a monument taken with a half-plate apparatus of Chevalier in from 12 to 15 seconds. In using 50 s, whether dry for views or damp for aits, 45 may be counted upon as successful; d, generally, the only failure that arises is mistaking the time of exposure.

* Most of our readers know that the gramme is about 15½ English, the decigramme, of course, being the 1-10th ramme.

Backing and Transferring Photographic Pictures.—From the *Repertory of Patent Inventions* we learn that Mr. Claude Langlois has a patent for the following process:—"I take first a negative picture in the ordinary way on glass with collodion, and then from this a positive is made on collodion and fixed in the ordinary manner, the light of a lamp, however, being used as giving more uniform results than daylight. To back this picture plaster of Paris is used, mixed into a paste, just such as will flow easily, and poured on to the collodion surface of the plate." The patentee continues, "over the plaster I apply a piece of muslin, or other open fabric, and then pour on more plaster, and so on until enough has been put on to form the thickness of back required. When I wish to remove the glass from the picture and to leave it on the surface of the plaster, I coat the plate, before printing the picture, with a thin solution of gum, which I allow to dry on, and then, when the picture has been printed and backed, I soak it in warm water, which dissolves the gum, and leaves the picture on the plaster. When dry the picture has a shining appearance, arising from the presence of the collodion, and to remove this I wash the surface with pure ether." To render the picture more suitable for colouring, the plaster is saturated with spermaceti or wax, the picture being allowed to remain until it is nearly soaked through to the surface. To strengthen the plaster it is cemented by shellac or otherwise to a block of metal, mill-board, or other suitable material.

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—In your Journal of last month, I read with some surprise the egotistical paper of Mr. Keith, read before the Photographic Society at Liverpool, wherein he claims the discovery of the use of iron developing solutions for positive photographs on glass. He seems little acquainted with the writings of the French and German photographers if he does not know that M. Martin published a paper in *La Lumiere exactly five years ago*, describing the use of iron solutions as developing agents; or perhaps (which is more likely), believes other people so ignorant or oblivious, that they are ready and willing to grant him the honor of a discovery to which he has wantonly and audaciously laid claim.

Mr. Keith wishes the world to believe that the use of this agent has hitherto been known only to himself, and that [for trade purposes] he kept the secret to himself, but now having no further need of such concealment, he offers his formula as a boon to the photographic world.

How comes it that thousands of people throughout the British Isles, America, and Europe, have been able to obtain by the use of iron mixtures such excellent pictures, worthy to bear comparison with any that Mr. K. ever produced, if a knowledge of its properties has been known only to himself and kept secret? He has his answer ready,—he communicated the discovery to two or three of his friends. Is it not curious that the whole civilized world should have been instructed by *these few friends* without ever Mr. Keith having known or suspected their betraying the trust reposed in them?

'Tis true that he sent Mawson, a dealer in chemicals in Newcastle, a copy of his formula for trial, but seeing nothing new in it, he made several changes

in the quantities of chemicals used before he recommended any of his customers to use it.

The fact is, that Mr. Keith has seen pictures in the Manchester Exhibition, equal if not superior to any of his best productions, by persons who until now were never known to practise photography, and fearing competition, he wishes to claim the honor of being the father of positives on glass. * * * I do not undervalue Mr. K.'s productions, but I protest against his egotistical claims. His success has depended entirely upon his manipulation.

Not, however, content with claiming a discovery which is not his, he vents his spleen against the Editor of the *Photographic Notes*, and accuses him of having surreptitiously obtained his formula, and, with a few alterations, published it in his *Notes* as his own. Mr. Sutton lays no claim to any new discovery, but simply gives his formula as one which produces generally better pictures than the others used by photographers. It is Mr. Sutton's business to cater as much as he can for the instruction and amusement of his readers, but no one would ever think of ascribing to him motives for publishing his formula but those of honour and honesty.

* * * * * *

I am, sir, yours obediently,

Durham, June 4th, 1857. I. O. C.

[We insert this letter in justice to Mr. Sutton; but we must say that I. O. C. appears desirous of returning "evil for evil."—Ed. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

Mr. Sidebotham.—We have received a series of questions addressed to this gentleman on the subject of his method of working the collodio-albumen process; if he will acquaint us with his whereabouts, we will forward them to him for his consideration.

A. A.—We are often asked for instructions as to the best mode of colouring glass photographs, to which we generally reply that is so rare to see any thing like a tolerable result, that we would rather keep the picture in its plain condition. We will, however, take the trouble to learn the exact manipulation of a good operator. We can already say, that practical skill and good taste are the chief things wanted.

J. Vac.—To those who ask how they can best put in artificial back-grounds, we reply—Do as one of our best operators does: take pains to have a proper back-ground behind the sitter. Artificial back-grounds are clumsy contrivances, and only succeed in very artistic hands.

Vignettes may be produced by cutting out a circular or an oval aperture in card-board, and then placing this partial screen at a short distance from the glass of the copying frame, moving the frame round, occasionally, if it be lighted unequally. We have seen both vignettes and back-grounds produced, by skilful manipulation, with cut-out screens, cotton wool, and a large flat camel-hair brush; and we have seen separate masks, prepared by an artistic hand, which could be used with different negatives.

Marco is informed that crystallised nitrate of silver is not proscribed as he supposes. In fact, if properly prepared, it is superior to most of the fused salt sold. Fusion of the *pure crystals* is recommended in order to ensure the absence of free acid, which is too often present in the commercial salt.

Durham.—We are always sorry to see names misspelt. Ebelmen was the director of the Imperial Porcelain Works at Sevres. Senarmont is the eminent French crystallographer.

Sol.—We object to the use of ether containing alcohol, since the amount of the latter cannot be ascertained; its specific gravity is no guide, as it may also contain water in unknown proport[ion]. Use washed ether, re-distilled and of known sp[ecific] gravity, then alcohol of ·825, itself containing w[ater], may be used. Of course more water can be a[dded] for experimental purposes. This is a very diff[erent] proceeding to taking ether obtained at random [and] tested only by its specific gravity. It is true [that] neither absolute ether nor absolute alcohol i[s re]quired, except in fundamental experiments, [but] there both are essential.

Dry Process.—Try the albumen mixture o[f] Bacot, described in this number, upon collo[dion], in place of the plain albumen of Mr. Crookes's [pro]cess; but dry the plate as Mr. Crookes directs.

Intensity.—We have seen Mr. Hardwich's [nega]tives, obtained by the addition of glycyrrhizi[ne to] his collodion. The increased intensity given [is re]markable. Some camera copies of prints ha[d the] intensity of albumen. It is quite a mistake to ne[glect] the use of glycyrrhizine.

X.—True, hydrochloric acid must be used i[n the] gold toning bath you speak of; but do you no[t see] the advantage of starting with a salt as pure as [pos]sible? Add the diluted acid afterwards, in a p[roper] measured quantity.

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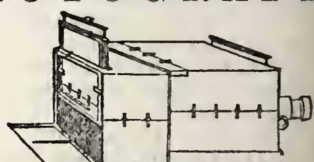

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

EW SERIES.] No. 13.—JULY 1, 1857. [Price 3d. Stamped 4d.

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 13.—JULY 1, 1857.

E unusual fineness of the past month has abled us to observe most of the public build- i s of London, under the effects of sunshine, a different hours of the day, and we have been m ch struck with the differences caused by a nospheric conditions, irrespective of the sun's a itude and direction. We have seen dull flat- l king objects suddenly exhibit a crispness of d ail and a decision of shadow that at other t es they seemed incapable of. We may in- s nce Lambeth Palace, as seen a few evenings s ce from the Thames, at from six to seven in t evening. The sun was unusually bright, t wind southerly, the eastern sky hazy and d k, and white clouds nowhere to be seen. T e Royal Exchange, on the contrary, appears t us to be best illuminated by the high mid-day s , reflected into the darker shades by white c uds in the west. We have never seen this b lding well illuminated in the more winterly m nths. Again, a street view, at the back of t Bank of England, is exceedingly picturesque a bout six o'clock in the evening, with a bright s and the wind south-easterly. Pictorially it is ot the same place at any other time. The L don Institution, which has an aspect nearly s th, appears to us most agreeable when the s has retired far into the west. Other build- i s seem improved by a slight haze, which we s netimes get, of a peculiarly transparent c racter. The inference we wish to draw fr n these observations is, that the photo- g pher should have his laboratory so arranged t t he can, at a few minutes notice, hasten to t particular scene he has studied whenever h attention is called to the existence of the f ourable conditions we have indicated. The s ne remarks, of course, apply to all localities, m re or less, although we have illustrated them o y by examples within reach of our own daily o ervation.

The collodio-albumen process as arranged by M Ackland deserves the attention of our r lers. In the present condition of our know- l ge respecting dry processes it seems to be n essary to try, fully and fairly, every modi- fi tion which is presented to us by operators o known ability. We advise those who are o y beginners in the art of using dry processes. t efer to Mr. Ackland's small *brochure*, where t y will find every part of the process most n utely described and illustrated.

Mr. Hardwich has favoured us with a note u n the subject of "corrugated," "reticulated," o "crapy" films. We are glad to find that so i ortant a point will soon be completely e lained. We know that several of our readers will join with us in expressing our thankfulness to Mr. Hardwich for his prompt communication.

Mr. Crookes's description of the wax paper process, as used by him at the Radcliffe Observatory, at Oxford, contains so many details which will be of service to all amateur photographers, and those details so complete and well planned, that we cannot bring ourselves to mutilate his work. The original memoir from which we take our first extract was printed for the Observatory, but never published, excepting in the shape of some brief extracts inserted some time since in the Journal of the Photographic Society.

We have received from Mr. Sidebotham a stereoscopic slide recently obtained from a plate which was made sensitive in January; the result is quite satisfactory. What we now want is a comparison of the processes of Taupenot, Hill Norris, Sidebotham, and in the order of publication, Crookes and Ackland. We must not omit Mr. Lyte and Mr. Shadbolt.

Through the kindness of Mr. Cottam we have received two numbers of a photographic work executed by members of the Manchester Photographic Society. The second number contains a portrait of W. Fairbairn, Esq., F.R.S., which is exceedingly well executed. There is also a good copy of an oil painting taken in full sunshine, the original, entitled "The Kiosk," is by F. Wyburd, Esq.

Our readers will perceive that the correspondence portion of our journal is developing its proportions. The cessation of the labours of most of the Societies leaves us space which we shall be glad to devote to any well considered letters of inquiry which may be sent to us, or to the brief record of carefully made experiments, which may not be sufficiently complete or important enough to form the basis of a communication to the Societies. All such matters will receive our immediate attention. In conclusion, it is due to our readers to say that we regret that the insertion of an incautiously expressed sentence contained in a paper communicated to the *Journal* previously to our control, compelled us, in vindication of our impartiality, to disfigure our pages for a while by a discussion carried on in a spirit unseemly at all times, but more especially so in the present case.

It is our intention to set apart a space to be called the "Amateur's Column." We shall commence with some general remarks upon photographic paper, or rather paper for photographic purposes; we shall then examine the various methods which may be advantageously resorted to for rendering such paper sensitive to light, &c.

The following is an extract from a notice which appeared in the *Liverpool Courier* in reference to the letter of "I.O.C.," published in our last number:

"LIVERPOOL AND MANCHESTER PHOTOGRAPHIC JOURNAL.—However fair it may be to let every man speak for himself, we consider it unjust to Mr Keith —a gentleman rapidly rising to the highest rank of photographers—one whose pictures contributed, we will not say how much, to the recent Government Art Exhibition in Post Office-place—to be exposed to anonymous attacks by such an unworthy scribbler. It will be remembered that in a previous number Mr. Keith published the formulæ with which he has produced such excellent pictures; and though much of his success is undoubtedly due to his own manipulation, part certainly arises from the chymical mixtures employed. Mr. Keith has a private receipt for forming his own collodion, the foundation of all glass photographs, but that he has not published, simply because the public will be better served if they purchase, through his agents, the collodion ready made. Photography becomes an expensive pursuit to the amateur, through failures, and often it is cheaper to buy than to make. To work with this collodion, however, the necessary solutions may be readily mixed; and Mr. Keith gave these to the readers of the Journal, without claiming any of them as a discovery. He could not lay claim either to the nitrate of iron as a developer, or cyanide of potassium as a fixer, yet he works with both. Hundreds of other photographers have manipulated with the same, though with less success; and it is not at all wonderful that the editor of another photographic journal should have used almost the identical formulæ. Mr. Keith takes notice of this, but does not assert or even hint at unfair play; he simply honestly makes the statement that the formulæ published are very nearly those with which he has for years worked, and that is all But this ill-natured writer, "I. O. C.," charges Mr Keith with claiming "the discovery of the use of iron developing solutions for positive photographs on glass," with profound historical ignorance of the science, and lastly, with accusing Mr. Sutton, "of having surreptitiously obtained his formulæ!" These untrue accusations are only paralleled by another, which is, "that he wishes to claim the honour of being the father of positives on glass!"

[We have elsewhere given a reason for the course we have taken, and have now only to observe that Mr. Keith has himself left his pleasantries and "I. O. C.'s "splenetic" reply to the "impartial readers'" judgment. We have no doubt as to the award being in the main in Mr. Keith's favour.—ED. L. & M. P. J.]

CHORLTON PHOTOGRAPHIC ASSOCIATION.

THE first monthly meeting of this society was held on Thursday, the 11th instant, at the Chorlton Town Hall, Mr. W. HEPWORTH, vice-president, in the chair. The room was decorated with a large number of fine specimens, contributed by Mr. Whaite, being the productions of the best English and foreign artists. After a preliminary address by the chairman, explanatory of the objects of the society, an interesting paper was read by Mr. Hooper on "Sang's Preservative Process," who also described a convenient and effective mode devised by him for the washing of plates after their removal from the nitrate bath. The next meeting is appointed to be held on the second Thursday in July, at eight p.m., when a paper will be read by Mr. Hepworth on "The Chemistry of the Collodion Process."

ON THE PRODUCTION OF PHOTOGRAP[…] ON FLUORESCENT SURFACES; AND […] THE DIFFERENT MODES OF RENDERI[…] VISIBLE THE ULTRA-VIOLET CHE[…]CAL RAYS.

BY GEORGE WILSON, ESQ., M.D.,

Professor of Technology, University of Edinburgh.*

"THE object of the following communicatio[…] to point out the importance of ascertaining w[…] influence the *fluorescence* of a surface has on[…] photographic sensitiveness. To myself […] question is interesting chiefly from its relat[…] to the theory of actinic action; but it has […]portant bearings on photographic art, and […] very little appears to be known on the mat[…] I have brought it before the Society. I enc[…]rage the hope that some of the practical pho[…]graphers who abound amongst its members […] take up the inquiry, and thus render a servic[…] actinic science as well as to their own beaut[…] art.

"It is scarcely necessary to mention that […] term *fluorescence* was introduced by Profe[…] Stokes, to denote the remarkable property […]sessed by many solids and liquids of chang[…] invisible actinic rays of high refrangibility i[…] visible rays of low refrangibility, the word […]nifying in its fullest sense the reduction or […]gradation of light-rays, *whether visible or* […]*visible*, into rays of *lower* refrangibility.† […] need I do more than notice, that the gre[…] number of the rays producing fluorescence […] those otherwise named, from their high ref[…]gibility, ultra-violet or extra-spectral, […] which, though themselves non-luminous, […]company the less refrangible visible rays, […] by the chemical and physical changes w[…] they induce on *actinolytes*, such as the salt[…] silver,‡ render possible an art of photogra[…]

"Premising these points, my chief object […] inquire what difference it will make in act[…]lytic or (which comes to the same thing), ph[…]graphic effect, when light, including the […]cially efficient ultra-violet rays, falls upo[…] fluorescent as distinguished from a non-flu[…]cent surface. The most perfect non-fluores[…] surface known to us is probably that of a ta[…] of porcelain. The light which falls upo[…] does not, to the extent to which it is retu[…] from its surface, exhibit any lowering of […]frangibility, nor are any of the invisible e[…]spectral rays changed into visible ones.

"On the other hand, a slab of the can[…]coloured uranium-glass has such a *degr*[…] power over light, whatever its source, tha[…] greater number of the invisible ultra-violet […] which impinge upon it are lowered in re[…]gibility and become visible. In conseq[…]

* Read before the Photographic Society of Scotland, May […]57.

† On the Change of Refrangibility of Light. By P[…] Stokes. Phil. Trans. 1852, pp. 478, 479, and 556, 557.

‡ We are in want of a comprehensive term applic[…] substances on which light exerts a chemical and p[…] change. In lecturing on the theory of photography, […] found the word *Actinolyte* so convenient, that I have ve[…] to introduce it in this paper. In its simplest etym[…] meaning, it signifies a chemical compound analysable […] components by light. I propose, however, to use it in a […] a sense as Faraday's term Electrolyte (from which it […] rowed), so as to include chemical synthesis as well as an[…] and in the present state of our knowledge it would be con[…] to extend the term to all the substances employed by […] graphers on which light exerts a marked sensible c[…] although it may be uncertain how far that change is ch[…] or mechanical.

this, the spectrum of any flame appears :atly more elongated when produced on the mium-glass than it does on porcelain, the ference being so great in the case of the ninous voltaic are developed between metallic es, that, as shown by Mr. Stokes, its specm on canary-glass is six or eight times ger than its spectrum on porcelain.

'Suppose, then, that the same actinolyte, such chloride of silver, is applied to the surface of heet of uranium-glass, and of a plate of porcen, and that each is then placed in a camera scura, or otherwise exposed, in exactly similar cumstances, to the action of light ; can it doubted that the chemical effect will be different on the glass, where the photographic 's are subjected to a remarkable change in perties, than it will be on the porcelain, ere they suffer no such change? Uraniumss is not employed by photographers, but ler fluorescent solids are in constant use, of ich I need only mention paper. Mr. Stokes s shewn that paper is distinctly fluorescent, ngating the spectrum at its violet end, and washing paper with a solution of sulphate of nine, we may render it nearly as fluorescent uranium-glass. Paper alone then, or still ter, *quinined* paper, as I shall call it, will present a fluorescent surface, such as may be de the subject of experiment in reference to question before us. That it may be worth ile to try experiments on the matter, will haps appear from the following statement. hough we are very ignorant of the mode in ich light acts when it induces chemical and er molecular changes, we cannot but expect ifference of action where a ray undergoes no eration till it encounters a chemical compnd, [as compared with the case where it is atly altered in physical properties before it nmences to induce, or whilst it is inducing mical change. One of the most energetic inolytic actions known to us, is that exerted sunlight on living plants. The yellow colour nost universally characteristic of budding ves and germs, is probably a provision for bling them at the period of their most active wth to absorb and turn to account all or rly all the chemical rays which reach them ; l the change from yellow to green in the more ture leaf or germ is perhaps a provision for sening the rapidity of the chemico-vital acns by diminishing the number of chemical 's absorbed. In either case the rays which absorbed may be regarded as at once and *ectly* expended in inducing both statical and namical changes in the growing organism, hough the mode in which actinic force is nsformed into mechanical, chemical, or vital ce cannot be traced. In the same way, when light passing through chlorine-water effects analysis of water into hydrogen and oxygen, l the synthesis of chlorine and hydrogen into lrochloric acid, we have an example of direct inolytic action, such as probably occurs ng with much more complex re-actions, in the at majority of photographic processes.

'But when light falls upon a fluorescent sure, the ultra-violet rays which, if it were fluorescent, would be absorbed by it, and ectly induce chemical change, are lowered in refrangibility, and their actinolytic power must be altered in at least two ways. 1st. To the extent that the ultra-violet rays are changed by degradation into visible rays, they come under the dominion of the laws of luminous, as distinguished from non-luminous light, and, as one result of this, are reflected visibly from fluorescent surfaces. Now it is not probable that such surfaces reflect, disperse, or radiate luminous and non-luminous rays to the same extent. I suppose that the luminous rays are rejected much more largely than those which are nonluminous, for the amount of photographic effect, *i. e.* of chemical change which could be induced by employing quinined paper to reflect the ultra-violet rays on even a sensitive actinolyte, would, I apprehend, be small, compared with the brilliant illumination which the same paper exhibits when placed according to Professor Stokes's beautiful initial experiment, in the *dark* space beyond the lavender ray of the spectrum. However this may be, it cannot be doubted that the change of dark into bright rays which fluorescent surfaces induce, will be accompanied by a change in susceptibility of actinic emission from the surfaces in question; and this will tell in favour of, or against, the photographic sensitiveness of a fluorescent body, according as experiment shall prove whether the ultra-violet rays are thrown off (and therefore lost for photographic purposes) to a greater extent before or after their optical degradation.

"2ndly. When a ray of high refrangibility is changed by a fluorescent medium into a ray of lower refrangibility, its chemical or actinolytic power must be correspondingly changed. On the undulatory theory at least this conclusion must be adopted; nor do I see how on any theory of light another conclusion is possible, although, of course, no hypothesis or theory could weigh against the results of experiment, should it point to an opposite inference. But in the absence of direct trial we seem entitled to infer, that when a ray, which by one prismatic refraction was carried far beyond the violet band of the spectrum, is changed by passage through a solution of sulphate of quinine into a ray, which on a second refraction appears, *ex. gr.* in the green band, it will exhibit the actinolytic or chemical power characteristic of green refrangibility.*

"Such, if I mistake not, is the view alike of Sir John Herschel and Professor Stokes, and I refer to it as conjectural, only because the *mode* in which rays of high refrangibility differ from rays of low refrangibility in chemical power, still awaits experimental demonstration; and we are as yet uncertain how far the difference is one of kind, how far one of degree, and whether or not the opposite ends of the spectrum exhibit a true relation of polarity.†

* It does not appear to be yet ascertained how far the degradation of light tells upon its relative chemical, luminous, and thermic qualities, *ex. gr.* to what extent the transmission through a fluorescent medium, such as uranium-glass, of ultraviolet rays of a certain refrangibility, changes them into less refrangible rays *entirely* luminous, entirely chemical, or partly both. In the text I have supposed a derived green ray to be accompanied by a derived chemical ray of equal refrangibility.

† The theory of Professor Stokes includes not only the convertibility of chemical into luminous rays, but of both into heat-rays. It is, *ex hypothesi*, possible for a non-luminous

"It is quite enough, however, for my present purpose, to urge that degraded light has its chemical power altered, and, therefore, that those ultra-violet rays which are retained by fluorescent surfaces must affect them otherwise than they do non-fluorescent surfaces, which receive the rays without lowering their refrangibility.

"I am anxious, accordingly, to induce practical photographers to experiment on this subject, for the sake of their own art, and of actinic science. The operations with the camera obscura, and the processes employed in photographic printing, alike admit of interesting trials being made. Paper washed with a weak solution of sulphate of quinine, or of infusion of horse-chestnut bark, or of acidulated infusion of turmeric, or of thorn-apple seeds *(Datura Stramonium)*, would furnish a highly fluorescent surface, not incompatible with the employment of some at least of the usual photographic chemicals or actinolytes. A partial wash, as of one half of a sheet of paper with a fluorescent liquid, would enable the contrast between the action of degraded and undegraded light to be readily observed, or the fluorescent substance might be added to the collodion, or to the exciting and developing solutions. But it is not necessary that I should trouble practical photographers with suggestions on these points. Their attested ingenuity in modifying processes will more than suffice for experiments of the kind proposed. I would rather urge a careful study of Professor Stokes's most lucid exposition of his own beautiful researches (Phil. Trans. 1850, p. 463), as the best preparation for the proposed investigation. As paper, glass, some kinds of gelatine, resin, and most organic bodies (including probably collodion), are fluorescent, the photographer is daily, though unconsciously, experimenting on the relation of fluorescence to photography. It is only desirable that by exaggerating the fluorescence of the media which he employs, he should bring into greater prominence phenomena which in his ordinary modes of working escape detection.

"The title of this paper refers solely to the production of photographs *on* fluorescent surfaces, but I wish to add a few words on the converse production of photographs *from* such surfaces. A plate of uranium-glass, and a plate of porcelain of equal dimensions and equally illuminated, will produce very different images on a sensitive surface in the focus of a camera. The uranium-glass changes the invisible rays falling upon it into less refrangible rays, which as such enter the camera. The porcelain reflects the invisible rays unchanged in refrangibility to the sensitive surface. The photographic effect must be different in the two cases. Now the the relative fluorescence of the various surfaces making up a landscape or a group of figures considered as imitable pictorially is very different, and this, I apprehend, is one cause, at present overlooked, why it is so much more difficult to photograph some objects than others. Porcelain and paper *ex. gr.* though equally white, a[nd] equally illuminated, will yield dissimilar pho[to]graphs to the camera, owing to their unequ[al] fluorescence. Mr. Stokes has shown that t[he] scarlet and crimson dyes obtained from safflow[er,] madder, and cochineal are strongly fluoresce[nt,] and this no doubt is one reason why soldie[rs'] uniforms and red articles of female attire are perplexing to portrait photographers. In g[en]eral, colour alone is taken into consideration affecting the suitableness of an object for pho[to]graphic copy; but two pigments of differ[ent] chemical composition may be of the same col[our,] and yet so unequal in their fluorescence, that one shall yield to the photographer a very di[ffe]rent result from the other. The mineral reds [ex.] *gr.*, such as vermillion and biniodide of mercu[ry,] are as a class much less fluorescent than the [or]ganic reds, such as carmine, and safflower (C[ar]thamin). An oil-painting, accordingly, and [a] copy in water-colours, although to the [eye] identical in tints, may yield strangely dissim[ilar] photographic transcripts.

"This is but one example: others mi[ght] readily be given. The varnishes used in [oil-]painting are fluorescent; so are green lea[ves,] the majority of vegetable and animal bod[ies,] and the dyes and tissues procured from th[em.] On the other hand, chalk, marble, the [ma]jority of minerals, the native and manufact[ured] metals, as well as porcelain, are non-fluoresc[ent.] Accordingly, our rules for copying photo[gra]phically natural and artificial objects, and [in] selecting not merely the colours but the tis[sues] or fabrics in which the human figure shoul[d be] draped, would be much more precise, if we k[new] the part which fluorescence plays in affec[tin]g photogenic results; and every such rule w[oul]d be a direct addition to the data of actinic sci[enc]e.

"Limiting myself in this paper to fluores[ce]nt reflection, I will only notice, in passing, [th]at fluorescent transmission is not less impo[rta]nt photographically. Its importance has [bee]n pointed out by Sir John Herschel and ot[her]s, and I will do no more at present than re[min]d photographers that, in printing from nega[tive]s, copying engravings, and otherwise empl[oyin]g *transmitted* light photographically, they [ha]ve continually to take into account the eff[ect] of fluorescent media, such as paper, glass, [p]ro-bably collodion, wax, albumen, gelatine [a]nd the like which they employ, in assisti[ng] or opposing the end they have in view.

"The last topic I have to notice is the r[u]les of rendering the ultra-violet rays visible. S[im]ple arrangements for effecting this, would r[en]der the phenomena and laws of fluorescence [m]ore generally familiar than they are at pr[ese]nt; and our knowledge of the relation of fluore[sce]nce to photography would be greatly increa[se]d if we had at command any easily mana[gea]ble artificial flame rich in ultra-violet rays.

"Professor Stokes has fully pointed o[ut] the most convenient and efficient modes of iso[lat]ing the extra-spectral *solar* rays and renderin[g th]em visible. He has also demonstrated the [qua]lity of artificial flames in respect of fluores[ce]nce, showing that burning hydrogen, alcoh[ol,] sul-phuret of carbon and sulphur, respectivel[y y]ield a much greater number of highly refra[ngi]ble rays than more highly illuminating f[la]mes.

ultra-violet ray to be degraded into a non-luminous ultra-red ray possessed of an *indirect* photographic activity, in virtue of its power to alter the temperature of actinolytes. We are familiar with the converse phenomenon (as specially noticed by Professor W. A. Miller) in the lime-ball light, where rays of low refrangibility proceeding from an oxyhydrogen flame are changed by contact with solid lime into rays of high refrangibility.

nic oxide, which I hoped would prove nore manageable than the combustibles l above, disappointed my expectations, fter trying many bodies, I have come back phur burnt in oxygen, as after all the most nient, although the irrespirable nature of ilphurous acid resulting from the combus- constitutes a serious objection to the use of ur, as well as of sulphuret of carbon. I presently show the Society the effect of illu- ing uranium-glass, solution of quinine, and on of horse-chestnut bark by sulphur d in globes of oxygen, and those to whom xperiment is new will not fail to be struck e remarkable change which those bodies, specially the liquids, exhibit when trans- l from an apartment lighted by gas to one d by flaming sulphur. The phenomena n the highest degree beautiful, and their ition will convince such as may have been ical before, that Professor Stokes's discovery hange in the refrangibility of light, is one e most interesting and important which t science has made. I am at present con- ing a ventilating lantern, by means of n I hope to keep up a continuous combus- f sulphur in oxygen without annoyance to xperimenter; and should it prove success- shall be at the service of any member of ociety, who will investigate the relation of scence to photography."—*Journal Photo- ic Society.*

ARKS ON THE PHYSICAL STRUCTURE OF COLLODION FILMS.

By F. Hardwich, Esq.

DES which have an alkaline reaction, such e iodide of potassium or the iodide of am- im, render collodion more fluid and struc- ess, whilst acid iodides, like the iodide of ium, have an opposite tendency. Col- n containing the iodide of cadmium is with ilty prevented from setting in crapy lines, he developer does not flow so readily as a film prepared with iodide of ammonium: , however, will depend upon the tempera- at which the pyroxyline was made, a high erature giving the greatest degree of ty.

The use of rectified alcohol of 820° sp. gr. s the film more smooth and even, when the is added in large proportion. But with ion containing only a small quantity of ol, water may be present to a considerable t without interfering with the fluidity.

Water in collodion is favourable also to a texture of the film, so that the fluid be- s more tenacious and contractile in propor- as the alcohol is strengthened by rectifica- Hence collodion made from spirits nearly drous will sometimes draw itself away from dges of the glass. The film of short tex- is always, however, more or less rotten: it s tightly to the glass and cannot be pushed in a connected skin, but a small stream of r directed strongly against any particular will readily make a hole.

Mr. Norris has lately drawn attention to the rtance of using a short and powdery collo- for the dry processes, but it is doubtful whether this condition of film is the one best adapted for the moist collodion process. Experiments made to determine this point appeared to show that a gelatinous and somewhat coherent collodion surface is more readily acted on by a weak light than a powdery film; and hence the gradation of tone will be more perfect in the former case. If this observation be correct, a short texture of the collodion is desirable only in so far as is necessary to keep the film upon the glass, and to prevent the solution of hyposulphite used in fixing from working underneath.

"*Reaction of Iodized Collodion to Test-paper.*—Useful information may often be gained by placing strips of blue and red test-papers in collodion, and allowing them to remain for several hours. If the salt of cadmium is used to iodize, the reaction should be acid. Commercial ether and alcohol are, however, liable to contain free alkali, either ammonia, or carbonate of potash (?). In photographing in a dull light, the presence of a trace of ammonia is advantageous rather than otherwise; but in a strong light the image may become too red under such circumstances, an alkaline state of film being favourable to reddening of the high lights. Hence in landscape photography a colourless collodion, faintly alkaline to test-paper, would probably give feeble skies. Free iodine added to such a collodion until it becomes yellow adds greatly to the intensity, although the same effect is not produced under opposite circumstances. In a glass house and in dull weather, for instance, an excess of iodine only serves to make the image more blue and to prevent the half-tones from being properly developed. Hence it is simply by correcting *over*-action of a powerful light that free iodine and acids are sometimes useful in adding to the intensity. These observations do not apply to a collodion containing organic matter. In that case the presence of free iodine may either increase or diminish the intensity, according to the nature of the organic substance."—*Journal of the Photographic Society.*

EXHIBITION OF ART TREASURES AT MANCHESTER.

We are now tolerably well used to the connection of electricity with celerity, and the encirclement of the earth by Puck's girdle has almost ceased to be a figurative expression; but it has been reserved for heliography to suggest a new adjective, which, coupled with speed, gives rise to an idea of something effected during its attainment. The velocity of electricity is evanescent. Its flight leaves behind no useful product that is directly traceable to its agency. But when one speaks of photographic quickness we certainly understand instantaneousness, but should at the same time be disappointed if nothing tangible remained. We are thus enabled to impress our sensitive plates with any image we please; and the sun at the same time is the most accurate limner in existence; the rapidity of the process being one of its chiefest advantages in portraiture, the features of sitters scarcely being motionless even for a second. The virtuoso bearing this in mind w'll doubtless be led to draw comparisons between the curious old miniatures in the gallery with the photogra-

phic portraits in their neighbourhood; and, whilst admiring them, will not fail to be surprised with their paucity as compared with the photographic miniatures of the present day. But we live in an age of progress; everything must be done not only well, but quickly, and our art is a good specimen of the requirements of the age.

A visitor to this gallery is able, with very little effort of fancy, to call around him, and almost to converse with, most of the celebrities of the present day. One of the earliest of these is No. 7, Douglas Jerrold, whose marble effigy has also a prominent place in the exhibition. Poor Jerrold! now gone to his last rest, who almost yesterday was one of our best favourites. Really, "time works wonders." But Mr. H. Watkin's (not Mr. Fry, as mentioned in our last,) does him, and his other subjects, but scant justice; yet he, perhaps, may favour us some day with some startling reason why he is so fond of exaggeration as to miss the minute detail of the art which otherwise he uses so well. Among his specimens, are (No. 4), "Our own correspondent," W. H. Russell; (No. 3) Dr. Winslow, and (No. 6) J. Gilbert, both names "familiar in our mouths as household words;" and Owen Jones (37), he of the Alhambra, and Luke Limner (38), of pictorial notoriety; G. Grote, the historian (24), is to us the best of this series. He also shows the disagreeable portraits of Lord Palmerston (117), and Lord Brougham (131). We mean no disrespect to those noblemen, and hope the artist did not. There are, too, by the same artist, a jaundiced image of Charles Selby (145), of J. R. Planche (144), of the Herald's College, and of the Mont Blanc-loving Albert Smith (148), who really seems about to tell us his own story of the Swiss who had sold clocks to all the potentates in Christendom. Mr. Watkin also sends us Mr. Dixon (142), of the *Athenæum*, (he likes photography, and might, we think, well extend his editorial notices of us). We have also, still speaking of Mr. Watkin's contributions, Madame Ristori (293), looking very unlike Medea, and Kenny Meadows (294), and the renowned Gordon Cumming (295), and Alexander Dumas (296), both renowned pullers of the long *bow*. There is also facetious Judge Haliburton, "Sam Slick" (290), the gallant Sir C. Campbell (412), and the fruit-painting George Lance (413). The *foregoing* are all disagreeably yellow, a fault which is, however, not confined to Mr. Watkin's pictures. Then Mr. J. Watkin's has Samuel Warren (No. 58), not to be mistaken even by his Midhurst constituents, in spite of the introduction of flake white; and Mr. Cusack Roney, the railway director (63), the laughter-stirring G. Cruikshank (61), and (62) Lord A. Paget, of her Majesty's yacht. We are inclined to place M. Claudet at the top of the list of photographic artists in portraiture; and speaking solely with reference to photography, we think his present contributions bear us out in our view. He sends the Rev. H. M. Birch, the Prince of Wales' late tutor (1), Sir H. Stewart (14), W. L. Chance (16), and Carlotta Leclerq (17, 85), Dr. Livingston (42), Lieut. Bellot (44), Dr. Hassall (45), Duke of Cambridge (80), coloured, Sir R. Peel (89), and the Duke of Wellington (90). Mr. T. R. Williams sends Charles Knight, Sir R. Mayne, and Capt. Baynes (20, 21, and 22), good e[...] specimens of vignetting, and Lord Brough[...] (41); (No. 51) Miss Brougham. (Why are la[...] generally represented leaning on chair bac[...] Messrs. Maull and Polyblank's series deserve g[...] ral commendation. They range through ev[...] department of science, enterprise, and literat[...] Among them are T. B. Macaulay (121), Sir [...] Cubitt (123), Dr. Rae (153), Earl of Burlin[...] (161), Sir C. W. Pasley (169), and M. F. T[...] per (174). Mr. Lake Price shows a first [...] portrait of Prince Albert (119), taken for [...] exhibition, Owen Jones (113), Clarkson S[...] field (114), George Cattermole (116), and [...] 138) has made an attempt at being pre[...] himself, we wish he had succeeded better. [...] Delamotte contributes portraits of the Rev. [...] Major, the late Secretary to the London Ph[...] graphic Society (28), and W. Mulready (4[...] No. 32, by Mr. Goodman, is a fine pictur[...] represents Miss Murray, as Lady Placi[...] Mrs. Inchbold's fine old play, "Everyone [...] his faults." There is a capital imitation [...] Crayon head, of the Bishop of Oxford, by [...] tencin, No. 68. Mr. Kilburn has not contrib[...] much, but his Mr. Mechi (No. 75), and P[...] Oscar (92), and Admiral Lyons (127), are wort[...] notice. Mr. Hannah sends a frame of [...] portraits (493), which well sustain his f[...] Mr. Howlett has a few good portraits of favo[...] painters, J. Chorsley (132), T. Webster ([...]), W. P. Frith (135), and T. Creswick (136). [...] Mayall contributes a large number of his [...] known specimens, including the Lord M[...] of London (95). Sir C. Campbell (99), [...] of Cambridge (102), Sir W. Molesworth ([...]), J. Gibson, R.A. (479), Prince of Prussia ([...]), A. Tennyson (483), and numerous ot[...] Messrs. Caldesi's collection is very fin[...] which we may name Miss Swanborough [...] looking uncommonly like a living piec[...] Dresden China; Signor Mario and Giulia [...] (887); No. 78, by Locke, is a good specim[...] this style; Messrs. Cundall's soldiers, (104, [...] 106), &c., are excellent; the Bishop of [...] chester (29), the Mayor of Manchester (31) [...] the Town Clerk of Manchester (35), by [...] Brothers, are worthy of their prom[...] position, and there are numerous other[...] merit by other artists. One picture by [...] Chadburn, of Liverpool, a portrait of Mr. M[...] can hardly miss observation; it is a collodio[...] trait on glass, so much exaggerated and so d[...] of definition, that it does not realise t[...] minds any of the essentials of a good por[...] Soon after the exhibition opened, we [...] another collodion picture, by a Manc[...] artist, hung in a good position; is it k[...] what has become of this and some others [...] have been displaced? Dr. Diamond's po[...] of insane women ought not to be silently [...] by, and were they accompanied by [...] description of their cases, would be of [...] importance to the student of *psychol[...] phenomena*.

We have previously entered our p[...] against the promiscuous hanging of touch[...] untouched photographs, so we have not d[...] it requisite to make any distinction a[...] the foregoing, a large proportion of [...] are indebted to the pencil of the artist as [...]

s to that of Phœbus himself. It appears from the atalogue, that there are 597 photographs exhibied; of these about 240 are portraits, so that we nust be excused if, though for the present onfining ourselves to them, we have made any nadvertant omissions. We cannot help thinking hat the committee might have communicated little more information in this catalogue, which is a meagre list, and not an enumeration f particulars, as Walker defines. Σ

THE COLLODIO-ALBUMEN PROCESS.*

By William Ackland, Esq.

'HIS process possesses nearly all the combined dvantages of the collodion and albumen proesses without the disadvantages. The plates re easily prepared, and when albumenised can e kept an indefinite time; and even when exited, the exposure and development may with afety be delayed for two or three weeks.

The time of exposure in the camera may be onsiderably varied, as an exposure of even ouble or treble the required time does not ffect the result: indeed, all that is necessary is o study the time required to bring out the deails of the deepest shades, and no fear of overxposure need be entertained. The collodiolbumen process, as introduced by Dr. Taupenot, as liable to many serious objections, which ven the talent of the inventor failed to overome; the most prominent of which were, listering of the film, and a yellowish brown olour of the negative, which interfered greatly ith the process of printing. These objections re now entirely removed, without affecting the eauty of the process in the slightest degree. hese important advantages over the others inuce us to give preference to the collodiobumen process; and we therefore proceed with ne description of it, merely premising that though our remarks will be confined to the roduction of small pictures, there will be found o difficulty in applying this process to those of rger sizes.

Before entering into a description of the maniputions, I propose to give directions for preparing ne various solutions. These solutions are—

Cleansing mixture.
Tincture of iodine.
Iodized collodion.
Iodized albumen.
Bath solution.
Gallic acid solution.
Silver developing solution.
Fixing solution.

CLEANSING MIXTURE.

Tripoli	4 drachms.
Cyanide potassium	2 ,,
Filtered water	4 ounces.

Dissolve the cyanide of potassium in the ater, then add the tripoli, and shake well ogether until perfectly mixed.

N.B. — *This solution is poisonous, and must erefore be used with caution.*

TINCTURE OF IODINE.

Iodine	1 drachm.
Alcohol	1 ounce.

Mix.

* "How to take Stereoscopic Pictures."—Simpkin, Marall, and Co.; and Horne and Thornthwaite, 1857.

IODIZED COLLODION.

The collodion necessary for this purpose must be such as, when poured on a plate of glass, yields a transparent and slightly coherent film, which does not admit of being lifted entire from the glass, and having a roughened surface when viewed microscopically. These properties are not possessed by collodion recently iodized; but good negative collodion, after being iodized as described below, will answer the purpose: it may be used if it has been iodized for months.

In order to iodize collodion for use in this process, add two drachms of negative iodizing solution ten drops of tincture of iodine, and ten drops of glycerine, to six drachms of negative collodion; shake well together, and then allow the bottle to remain undisturbed for at least one hour, in order that any insoluble particles may settle to the bottom; then pour off the clear portion into a clean and perfectly dry bottle for use.

In operating with this volatile article, never approach with a light near the open bottle, or accident may arise from its inflammable character * * * * * *

IODIZED ALBUMEN.

After trying various experiments on the best formulæ for this liquid, I am led to conclude that none exceeds the following:—Take three eggs and carefully separate the yolk and germ; pour the white into a measure, which will give about eighteen drachms of albumen. Add to this six drops of glacial acetic acid, and stir the whole together for two minutes with a glass rod, then leave it to rest for *one hour*.

Now slightly plug the neck of a clean glass funnel with a fragment of sponge, and pass through it a few drops of distilled water to moisten it. Next place on the sponge one scruple of iodide of ammonium, and on the top of it pour the now semi-coagulated albumen, and two drachms, by measure, of treacle. This passes readily through, dissolving in its passage the iodide of ammonium in the filter.

The result from this preparation should be *perfectly limpid;* if such is not the case, press the sponge more tightly into the neck of the funnel, and filter till it is so, as *germ* on the plate is still worse than dust.

BATH SOLUTION.

Nitrate of silver, fused	10 drachms.
Kaolin	3 ,,
Iodide of ammonium	6 grains.
Glacial acetic acid	½ ounce.
Distilled or filtered rain water	16 ounces.

Dissolve the nitrate of silver in four ounces of the water, and add it to the iodide of ammonium; shake well together, then add the remainder of the water, and filter to separate the yellow precipitate which is formed. Then to the clear the solution add the kaolin and acetic acid.

GALLIC ACID SOLUTION.

Gallic acid	1 scruple.
Filtered rain or distilled water	4 ounces.

Place the gallic acid in the water, shake frequently, and keep the bottle in a warm situation for some hours, so that the water may dissolve as much as possible; then remove any that remains by filtering just prior to using the solution.

SILVER DEVELOPING SOLUTION.

Nitrate of silver	....	1 scruple.
Glacial acetic acid	... .	20 drops.
Distilled or rain water	...	4 ounces.

Dissolve the nitrate of silver in the water, then add the acetic acid, and filter for use.

FIXING SOLUTION.

Cyanide of potassium	......	10 grains.
Water	....	4 ounces.

Dissolve and keep in a closely-stoppered bottle for use.

N.B.—*This solution is poisonous.*

For the benefit of the non-chemical reader, we will point out the keeping qualities of these solutions :—

The cleansing mixture, tincture of iodine, iodized collodion, silver developing solution, and fixing solution, will keep good any length of time.

The gallic acid and iodized albumen solutions cannot be depended on if they have been made longer than four days.

The bath solution does not change by keeping, but requires the addition of ten grains of nitrate of silver to each ounce, after being used to excite about forty plates; and if it becomes brown, the addition of a little more kaolin will remedy the defect.

FILTRATION OF ALBUMEN.

As iodized albumen filters very slowly through, and soon clogs up the pores of filtering paper, a fragment of sponge, pressed lightly into the neck of a funnel, must be employed instead.

THE OPERATING ROOM.

In order to prepare the collodio-albumen plates, and properly to develope the picture, an operating room is absolutely necessary. By this it is not meant that a room built expressly is needed, for almost any room can, in a few minutes, be made to serve our required wants, but the only absolute condition that must not be deviated from is, that no light shall enter the room except what passes through three thicknesses of yellow glazed calico. The most convenient room is one facing the north, and with one window only. Prevent any light passing in by the upper half of the window, by closing the shutters, or covering it with any black material impervious to light, and cover the lower half with three thicknesses of yellow calico. Close the door, and carefully observe if any gleam of light enters the room, except what passes through the yellow calico; should any crevice be detected, it must be covered over, as the intrusion of white light through the smallest chink is often sufficient to spoil a picture, although light that passes through three thicknesses of yellow calico does not affect the picture, and affords sufficient illumination for all our operations.

A table placed close to the window, a gutta-percha tray to receive any liquid that may fall in developing, a good supply of cold water, a hand-basin, and a couple of linen cloths, complete all the requirements.

It will sometimes happen in travelling that a room may fall to our lot which would give us too much trouble to convert into one fit for the purpose. In that case our manipulation must be deferred until night, and an ordinary candle placed behind a double thickness of yellow calico may be our source of light.

CLEANING THE PLATE.

To clean a new glass plate, pour a teaspoonful of the cleasing mixture over the centre of the plate, and with a pledget of linen well rub it over every part of back and front; then rinse it in a basin of cold water, or hold it under a tap so as to remove every particle of the mixture; next, without waiting for the plate to dry, remove all traces of moisture with a linen cloth, and polish with another linen cloth, holding the plate by the cloth and not by the hand, so as to prevent the slightest grease being communicated to it. The cloths employed should be of a material sold as "fine diaper," and must be well freed from grease or soap, by careful washing in soda and water, then plentifully rinsed in water and dried; also the one used as a polisher should be kept quite dry. Occasional breathing on the plate during the polishing, and then holding it obliquely, so that the moisture deposited may be seen by reflected light, will serve to point out whether a plate is clean or not. If the moisture of the breath is deposited in patches, more cleaning is required; but if the deposit is evenly spread over the whole surface, it may safely be considered as clean. Glass plates, after being once used, require to soak an hour in a solution of four ounces of common washing soda to one pint of water, so that the hardened albumen coating may be softened and easily rubbed off. They have then to be cleaned as before-mentioned for new plates.

(To be continued in our next number.)

DESCRIPTION OF THE WAX-PAPER PHOTOGRAPHIC PROCESS.*

By W. Crookes, Esq.

1. Before attempting to select from the nume rous photographic processes the one bes adapted to the requirements of meteorology, i was necessary to take into consideration number of circumstances, comparatively unim portant in ordinary operations. To be of an value, the records must go on unceasingly an continuously:

1st. Therefore, the process adopted must b one combining sharpness of definition, wit extreme sensitiveness, in order to mark accu rately the minute and oftentimes sudde variations of the instruments.

2nd. To avoid all hurry and confusion, it is the utmost importance that the prepared pap or other medium, be of a kind capable of r taining its sensitiveness for several days.

3rd. The contraction which paper undergo during the numerous operations to which it subject in most processes, (in general rather advantage than otherwise), is here a serio objection; for this reason, the experiment fi tried, of transferring to paper the image receiv on collodion preserved sensitive by the nitra of magnesia process, was a failure.

4th. Strong contrast of light and shade, a absence of half tint, unfortunately so comm amongst ordinary photographic pictures, is this case no objection.

5th. It is essential to preserve the origi results in an accessible form: and for t reason, the daguerreotype process, admira

* Employed for the photo-meteorographic registration the Radcliffe Observatory, Oxford.

it seems to answer other requisites, is obviously not the one best suited to our purpose. Lastly, the whole operation should, if possible, so easily reducible to practice, that with a y small share of manipulatory skill, the loss even a day's record would be impossible.

. Bearing these conditions in mind, on king over the photographic processes with ich I was acquainted, that known as the x-paper process, first described by M. Le ıy, seemed peculiarly applicable. In sharp-s it might be made to rival collodion; and ough generally stated to be slow in its ion, I had no doubt that its sensitiveness ıld be easily increased to the required degree.)f all paper processes, I believed it to be the most free from contraction, either during time it is undergoing the action of the light, n any subsequent stage. Its chief superiority, vever, consisted in its capability of remaining sitive for so long a time, that it is of little isequence whether the sensitive sheets be a or a week old. Then the comparative wness of the development, which has always n looked upon as one of its weak points, uld be in this case a positive advantage, as pensing with that care and attention which st always be bestowed on a quickly de-oping picture.

n addition to all these recommendations, it s a process to which I had paid particular ention, and consequently the one in which I ght naturally hope to meet with the greatest ount of success.

3. The general outline of the process does not fer materially from that which I published ne years back in *Notes and Queries*, vol. vi. p. 3; but as that account was written for prac-al photographers, the details of the manipu-ion were brief. It has therefore been thought visable, that while describing again the whole ocess, with the addition of such modifications the end in view requires, I should also give ch fuller description of the manipulation, as y render it more serviceable to those who ve not hitherto paid attention to photography its practical details; this must be my excuse, to some I seem unnecessarily prolix. None t a practical photographer can appreciate on what apparently trivial and unimportant ints success in any branch of the art may pend.

It may not be without service, if, before tering into the practical details of the process, ay a few words respecting the most advan-geous way of arranging a photographic boratory, together with the apparatus, chemi-ls, &c., which are of most frequent use.

Among those requisites, which may be almost lled absolute necessaries, are gas, and a plen-ul supply of good water, as soft as can be ocured.

4. The windows and shutters of the room ould be so contrived as to allow of their ther being thrown wide open for the purpose ventilation, or of being closed sufficiently ell to exclude every gleam of daylight; and e arrangement should admit of the transition om one to the other being made with as little ouble as possible.

5. A piece of very deep orange coloured glass, about two feet square, should be put in the window, and the shutter ought to be constructed so as to allow of the room being perfectly darkened, or illuminated, either by ordinary daylight, or daylight which has been deprived of its photographic rays, by filtering through the orange glass. The absorbing power of this glass will be found to vary very considerably in different specimens, and I know of no rule but experience to find out the quality of any particular sample; the best plan is to select from a good stock one of as dark a colour as possible. The proper colour is opaque to the rays of the solar spectrum above the fixed line E.

6. The best source of heat is unquestionably gas. It will be as well, however, to have a fireplace in the room, as, in some cases, a gas stove will be inapplicable. There should be gas burners in different parts of the room for illumination at night; and also an arrangement for placing a screen of orange glass in front of each.

Several rough deal benches should be put up in different parts of the room, with shelves, drawers, cupboards, &c. The arrangement of these matters must of course depend upon the capabilities of the room.

7. The following apparatus is required. The quantities are those that we have found necessary in this Observatory.

- Eight dishes.
- Eight mill-board covers.
- Three brushes for cleaning dishes.
- A vessel for melting wax.
- Two gauze burners.
- One box iron.
- Filtering paper.
- A still for water.
- One platinum, and three bone spatulas, (flat paper knives).
- Six funnels.
- One funnel stand.
- Pint, half-pint, one ounce, and one drachm measures.
- Three glass flasks.
- Boxes for holding paper.
- Scales and weights.
- Sponge, glass rod, stoppered bottles, &c.

8. The dishes may be made of glass, porcelain, or gutta percha. Glass and porcelain are certainly cleaner than gutta percha; but for general use the latter is far preferable, as with it there is no risk of breakage, and the bottom of the dish can be made perfectly flat, which is a great advantage. These dishes should be made of sufficient length to allow of a margin of about half an inch at each end when the paper is in; and the shape should be made as nearly square as possible, by arranging them to take two or three sheets side by side.

The gutta percha should be of a good thickness, otherwise it will bend and give way, if it be moved when full of liquid. The depth must depend upon the size of the dish, and the purpose for which it is intended. The dishes in use here accommodate three sheets of paper side by side; they are fifteen inches square, and one inch and a half deep. I think, however, for some purposes, where they are not wanted to be moved about much (i. e. those for holding the bath of hyposulphite of soda for fixing), the depth might be advantageously increased to

two inches and a half. Each dish ought to be reserved for a particular solution, and should have a piece of mill board a little larger than itself for a cover.

9. The brushes for cleaning the dishes are of two sorts: a common scrubbing brush will be found the best for all parts but the corners, and for these another kind must be used, having a handle about a foot long, at the end of which are tufts of stiff bristles, projecting about three-quarters of an inch, and radiating on all sides, forming a ball about two inches and a-half in diameter. Hardly any dirt will be found capable of resisting this brush, if it be pressed into a corner, and twisted round several times. The dishes ought always to be put away clean, as the dirt is much more difficult to remove if allowed to dry on.

(To be continued in our next number.)

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—In answer to your remarks on "corrugated collodion films" in the last number of the *Liverpool and Manchester Photographic Journal*, I may reply that I have collected some important facts on that subject, which I intend shortly to publish. The experiments will show that not only the *temperature* of the mixed acids, but also the particular kind of fibre acted on, affects the result, and further that by subjecting the paper to the influence of an alkali, or by converting it into parchment paper by Gaine's method previous to its immersion in the nitro-sulphuric acid, the tendency to glutinosity in the resulting pyroxyline is entirely destroyed, and the collodion film becomes short and structureless.

Yours, sir, most obediently,

F. HARDWICH.

King's College, June 15th, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—In your last Journal my name is connected with a mis-statement, which I beg to be allowed to correct. Your correspondent, "I. O. C.," says Mr. Keith sent me "a copy of his formula for trial," and that I "seeing nothing new in it, made several alterations in the quantities of chemicals used before recommending it." Now, the fact is, I have invariably recommended Mr. Keith's formulæ, without essential alteration, ever since he communicated them to me, now two years ago. For more than a year, in connexion with my collodion, I have most extensively published them, and by this means hundreds, I believe, I may, without exaggeration, say thousands have become acquainted with them, and benefited by their excellence, ignorant of the obligation they are under to Mr. Keith.—I am, Sir,

Your obedient servant,

JOHN MAWSON.

Newcastle-upon-Tyne, June 19th, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—We have lately seen in the columns of *The Times* a somewhat acrimonious dispute waged between two eminent philosophers, in regard to the invention of the stereoscope; one of them laying claim to this honour for himself, while the other refers back the germ or principle of the invention to an ancient Greek philosopher. Without presuming to say whether Sir David Brewster or Professor Wheatstone has the best of the argument, or indeed whether either of them be perfectly right in his view of the matter, it may be safely affirmed th until photography supplied the means of giving pr tical effect to the discovery, neither the theory binocular vision nor any other theory could ever h resulted in the production of so exquisite and u rivalled a philosophical toy as the stereoscope, and believe that there are other departments of optics which photography is capable of conferring a simi service.

There is, for instance, an optical toy called panopticon, or magic circle, with which most of yo readers must be familiar. By a very simple arran ment, a succession of figures varying slightly fr each other, are made to appear as one figure motion, or in the performance of some regularly curring action. A series of such figures taken photography would undoubtedly possess an iden and truthfulness unattainable by any other proc and would thus be better adapted for the purp than drawings or prints, however carefully execut could be. And might not a combination of this c trivance with the stereoscope be constructed, so as form a very amusing and popular variety of the la instrument? There are various ways in which combination could be effected, but probably following might be the most convenient:—

In the first place, the photographic artist hav decided upon the scene or action or group of acti he wished to represent, and having made arran ments with a person or number of persons for t purpose, would require to have them so instruc that they would allow him to take stereoscopic vi of a scene at a number of—say eight or ten—diffe stages of its progress; that is to say, one entire p formance of the action or scene represented sh be interrupted by ten arrests or stops for such peri of time as would allow of as many stereoscopic presentations being taken. The positives of th views, instead of being fitted up in the usual man would require to be pasted upon a sheet of card, underneath the other in their consecutive order. means of a penknife and ruler, a cut should nex made between each of the pairs of views, in orde cut half through the card, so as to allow of its b bent at those lines, and thus closely applied to surface of a decagonal or ten-sided drum, t which any number of such sets of views coul attached seriatim if required.

The drum or cylinder with a set of views attached to it, should then be placed in its posi by fitting the two extremities of its axis into soc on the stereoscope adapted to receive them. person now looking into the instrument, there w be presented ten stereoscopic views slightly diffe from each other according as each successive pic was brought into the field of view by the revol of the drum. But to produce the magical illusi there being but one group, and that in active and like motion, a small addition to the apparatus w be necessary, namely, a shade or diaphragm to of the eye-glasses, by means of which they cou covered and uncovered in harmony with the m of the drum. A handle could, by means of simple mechanical arrangement, which it is un sary now to describe, be made, while rotatin drum, to cause the shades to cover the two eye-gl except at the moment when each successive pi was brought into the field of view—except a moment when it was at right angles to the ax of vision.

An improvement, and one which would very m economise the work of the photographer, would represent the parts of the scene not in motion, by fixed view in the form of an ordinary photogr slide, through and immediately behind a central space in which the figures on the drum could be in motion, thus giving to the whole the appearance

a mimic stage representation, and converting the trument into what might not inappropriately be ignated a stereoscopic theatre.

The proper way, I conceive, to use the instrument ıld be, in the first place, to look intently at the ne with the first of the series of figures in position, as to get a thoroughly stereoscopic view of it, and n to commence turning the handle at such a speed night be found to produce the most natural and stic pantomimic effect.

When I mention that I have not constructed nor empted to construct a machine upon the principle v described, your readers will be apt to ask how I ld expect anyone else to bear the *onus probandi*—ake the trouble of practically testing the value the suggestion. My explanation of this is the at difficulty which I should find in procuring views able for the purpose. But by its being brought ler the notice of photographers, who have trained ers, or rather actors, and other requisite expe- nts at their command, perhaps some of them may induced, if I have made my description sufficiently elligible, to put it to the proof. If this should ve, I can only wish that the result may be so remu- ative as to repay the artist for his trouble.

I am, your obedient servant,

WM. FRASER.

St. Nicholas-street, Aberdeen,
June 17th, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—In developing my negative pictures taken ıer by the ordinary wet collodion or the collodio- ımen process, I find it exceedingly difficult to ıin the film on the plate in the subsequent shings.

. use pyrogallic acid for a developer, and it seems be of little moment whether it is used as strong as rains to 1 oz. of water, or as dilute as 1 grain; in ıer case I have the mortification of seeing the ult of many an hours' labour vanish the moment our on the water.

have roughened the edges of the glass, diluted collodion, allowed the collodion to get well set ore sensitizing, and diminished the quantity of tic acid in the developer—remedies proposed by ious photographic friends, but all to no purpose. ıave partially overcome the difficulty by pouring water very carefully from a jug on to the centre the plate, and allowing it to run to each side suc- sively, but even then I am not unfrequently iled. I may add that when the plates are de- oped with protosulphate of iron, the films will r any amount of washing, unless they are after- ds bleached with the bichloride of mercury, when y exhibit the same tenderness of film.

f you can suggest any remedy, you will greatly ige, I am sure, not only your humble servant, but ıy another

TROUBLED PHOTOGRAPHER.

nchester, June 17th, 1857.

The nature of the collodion affects its adhesive racter. Try the addition of a few drops of water the collodion; or use a collodion made with oxyline which has been prepared at a high tempe- ure. Not knowing how the collodion was made can only guess at the cause of failure. Photo- phers should avoid operating with empirical pre- ations; many respectable manufacturers now ke no secret as to the preparation of their collo- n. This liberal course will shortly enable all ervers to make comparative experiments with a asure and satisfaction highly conducive to the ancement of the art.—ED. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—On reading that "mountain-in-labor" production of "I. O. C.'s," I had to refer back to Mr. Keith's paper, but I could not find that he claims any such honor as being the discoverer of iron as a developer. Under the circumstances it was absolutely necessary for Mr. Keith to make the remarks he did, otherwise he would no doubt have been accused himself of making use of Mr. Sutton's formula; but he does not, to my reading, imply that Mr. S. has surreptitiously obtained his.

I have scarcely spoken more than half a dozen words to Mr. Keith in my life, though I have used his collodion and corresponded more or less for the last two years. About twelve months since I wrote to him, and asked him some questions about protonitrate as a developer, and he sent me the same formula given in the paper referred to. [Here the writer proceeds to remark upon our insertion of "I. O. C.'s" letter, which he says is "full of spleen," and "based entirely upon false conclusions." He concludes:—] If Mr. I. O. C. quarrels thus with every one who does not use language to square with his ideas, he must be an important man in Durham; but I for one would not give much for the *good will* of his business. Apologizing for the length of this epistle, I am, sir, yours respectfully,

Cumberland, June 20th, 1857. Z.

[We have inserted the letters of "I. O. C." and "Z." although disapproving of their tone, because we think a certain passage in Mr. Keith's paper might be construed into a charge against Mr. Sutton; at the same time we think too much has been made of the matter. Z. must allow us to remind him that Mr. Keith was the assailant, and to observe that *we* should strike out such a passage as the one complained of, come through whatever Society it might. —ED. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

MR. CROOKES' TUBE.—Many thanks. It is evidently an error, and so obvious that we trust none of our readers have poured back the fluid from the plate into the filtered portion *i*. All fluids to be filtered or re-filtered go in at *g*. Perhaps the bulb would be better if a little larger in proportion to the rest of the tube.

DRY PROCESS.—You may proceed as we directed; or, not to complicate the mixture, use Bacot's albumen mixture alone directly upon the collodion; this we suggest to you as an experiment. We shall be glad to know the result, as it must serve to elucidate either the theory or the practice of dry processes.

JOHN LAKE.—Glycyrrhizine was not recommended for positives. Any respectable vendor of photographic chemicals can procure it for you. We cannot recommend you to any particular house. Both the names you mention are of good repute. We cannot give you the whole printing process in "Answers to Correspondents." Any elementary work will do to begin with; having done your best with that, mention precisely your difficulties.

Want of space compels us to leave over our replies to several other communications until the publication of next number.

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iverpool & Manchester Photographic Journal.

New Series. No. 14.—JULY 15, 1857.

know of no subject at the present time of ter interest to the photographer than that ry processes. It is, therefore, with much sure that we to-day direct the attention of readers to the dry collodion process of Long, a summary of which, extracted from uthor's concise work on the subject, will be d in another part of our impression. We k it right to give all the publicity that we to the efforts of all who are working in this tion, and we trust that in doing this we give no offence to those authors from whom quote so freely. Having requested our ers to refer to Mr. Ackland's detailed de- tion for their more exact guidance in carry- out his process, we must, in common fair- advise all who are interested in dry esses to obtain Mr. Long's clearly written hlet. In his preface, which we quote for ptness, he says—"The following pages be devoted to the description of a process ry collodion, which I believe to be at once le and effective. The experiments con- ed with the perfection of this process have pied my leisure time for the space of two or more, and have been conducted with e care of which I was master. The con- repetition of them enables me to say that ver will follow diligently the process step tep, as detailed in this pamphlet, must ed in producing pictures in every way as could be required by the most exacting . The process is simple, clean, and ex- ious; and the resulting negatives possess xquisite softness of albumen, the brilliancy wet collodion, and the fine artistic texture e paper process. To disarm criticism, and ke peace with my fellow-labourers in our wish it to be understood that I do not the use of collodion, of gelatine, or of -gelatine, or of any of the chemicals used process. Most of these have been em- d by others, in various ways. I merely ve to myself the pleasure of placing in the s of photographers a definite and simple by which pictures may be taken on dry lion."

The description of the wax-paper process by Mr. Crookes is for this number suspended. A publisher, for whom Mr. Crookes is preparing a general account of the wax-paper process, objects to our reprinting the *Radcliffe Observatory Instructions.* We abstain for the present from particular comment upon this proceeding, simply observing that we learn, from good authority, that the wax-paper process has been replaced in the Observatory of Paris by one which M. Leverrier says is more simple, expeditious, and inexpensive. Our readers shall shortly be put in possession of a critical comparison of the two methods.

We have seen specimens of the coloured images of M. Testud de Beauregard, about which there has been so much discussion. The colour is not obtained directly by the action of the light, but is developed by the subsequent action of a solution in which the picture is immersed. It remains to be seen whether these colours are strictly related to those of the natural objects, or only obtained by an ingenious process of tinting.

An enthusiastic contemporary has devoted much space to the consideration of a new permanent printing process, which, we are assured by him, has not been invented by the Printing Committee of the London Photographic Society, but which is the discovery of a M. Sella. It consists in steeping paper in a solution of bichromate of potash, drying and exposing to light in the usual manner until a faint image is obtained. The paper is then washed to remove the unaltered bichromate, after which it is immersed in a solution of a vegetable colouring matter which is found to precipitate its substance upon the part "mordanted" by the bichromate, while under the influence of light. In the place of a vegetable dye, a solution of sulphate of iron may be used. This, however, gives no distinctly visible image; so it is necessary, after the washing process, to immerse the paper in a solution of gallic acid. As soon as this is done the image developes itself of a true inky hue—gallate of iron being formed. The process is ingenious, and we trust it may be made available, in spite of the difficulties which obviously attend it. As to its merits, on the score of gradation of tint, as well as great permanency, we have considerable doubt. We will not, however, throw out merely theoretical objections, which might damp the ardour of investigation.

EXHIBITION OF ART TREASURES AT MANCHESTER.

It has always been esteemed a great advantage to the tourist, whether he journey through the beauteous regions of nature, or ramble among the inestimable treasures of art; whether he turn aside to contemplate the ancient reliques of times gone by, or to examine the triumphs of modern engineering skill, that the memory should be assisted by some means within his grasp. A portfolio of engravings, a wallet of fragments selected by himself (ofttimes to the great detriment of the object of his visit), are of themselves great and useful adjuncts to the tablets of memory, on which, with a pen of a writer more or less ready, every one writes to some extent. These things are not to be valued according to the simple standard of what they will fetch, if offered to competition, but are enhanced in worth by the associations which connect themselves inseparably with the objects or places visited, and which value, somewhat selfishly, can only obtain in the possessor's own mind. But when a traveller can by simple chemical appliances reproduce, not only to his own, but to the eyes of every one, the actual scene in which his delight was aroused, and in a great measure excite the same pleasurable feelings in others which he experienced himself, it must be clear that the benefit becomes infinitely less selfish, and its extent is only confined by the limits of reproduction. Now photography is a combination of these contrivances; the ingenuity of many minds has arranged means which, if rightly made use of, can extend our most treasured reminiscences to those around us, and at the same time may increase our own enjoyment. But the photographer needs warning; it is not sufficient that a subject represented shall be so merely in a matter of fact manner, but its aspect must be favourable. A painting of Vesuvius, without the usual concomitants of an eruption, as detailed by Pliny, or the picturesque pine tree-like cloud which usually precedes it—a view of Niagara without a rainbow, would be to many people uninteresting: it would not certainly sustain our view of the matter, if we presented subjects like these without the accompaniments, simply because when we visited them they were absent. It is therefore incumbent on our photographic friends that they choose the most favourable conditions of which they can possibly avail themselves, and in this we are only seconding the opinion of a writer in the leader of the last number of this Journal. This idea is one which will hardly fail to occur to a visitor to this exhibition; for without some conceptions not necessarily suggested by the scenes themselves, many of the artists would have quite fallen short of our standard of excellence. The department of photography which we propose at this time to notice, commences with the Falls of Niagara (Nos. 110 and 140); these are interesting as the work of an American artist, whose name is not known to us, and still more so as faithful representations of a scene which has long been regarded as one of nature's most marvellous masterpieces. We next notice two Alpine scenes, by Martens (112), Glacier du Rhone and (138*) Monte Rosa; and, view[ing] pictures of these and similar scenery, we can[not] fail to be struck with astonishment at the res[ults] obtained. We have not hitherto been favo[ured] with any account of Alpine photography; [but] comparing great things with small, we [are] sure, from the impediments which beset the ambitious artist, that the difficulties of th[e] higher regions must be immense. They [are] mostly of an altitude which is unattainabl[e in] this country. That of the Finsteraahorn, [ex]hibited by Prince Albert, is an immense hei[ght] above the level of the sea. While speakin[g of] the region of everlasting snow, we may ment[ion] as fine specimens of photography, Matterh[orn] (184), by Mr. De la Motte; Le Mont Ce[rvin] (231), Flühlen, with fine cliffs in the backgro[und] (264), Lucerne (272), with a somewhat sp[otted] sky, by Martens; Glaciers (355); (359) the [Mer] de Gluce, is a fine picture, though somewhat [in]distinct in parts; (216), Monte Rosahas, [the] atmospheric effect of distance quite illus[trated], exhibited by Murray and Heath. Me[ssrs.] Dolamore and Bullock's contributions [rank] amongst the first of their class, both as fav[our]ably chosen scenes and excellent specimen[s of] photographic printing, being characterized [by] a decisive clearness which is not often excel[led]; and the productions of Mr. Bedford bear als[o the] same marks. Of the former may be menti[oned] Rydal Fall (179), with capital transparent wa[ter]; Aber, N. Wales (183); Coast Scene (200); [the] latter is a capital study for a geologist; (, a mill, at Ambleside, is an example of ph[oto]graphy much more agreeably told than in ; (207), Stock Ghyll Force, a favourite sc[ene]; also (193), on the same stream; (198 a frame containing four landscapes — Ha[mp]stead Heath — evidently taken quickly [so] that we almost might expect to find im[ages] of rabbits emerging from the brake in [the] foreground of No. 1. (220) Rydal Ch[urch] is not so successful, but is interesting, as a [spot] sacred to the memory of the best of the [lake] poets. (217), Lyulph's Tower — we thi[nk a] view from the west would have been [pre]ferable; (232) Rydal Water, another fav[ourite] spot. (238) Glastonbury Abbey, (245) Ulles[water] (347) Conway Castle, (502) On the Rothay. [By] the latter artist are a fine view of Pont [Aber]glashyn (222), and (284) (286), a Gatew[ay at] Canterbury, and (320) the Baptistry o[f the] Cathedral of that city. (364), (366), and [368], Welsh Landscapes, which for fine defi[nition] may be registered as very beautiful [speci]mens; (510) and (514) are other fine [views] at Canterbury. There are some good s[tudies] of trees, marked T. Bedford, the same [artist], we presume. (226) Fir Trees, (325) [...its], (182) Pont du Diable, by Mr Delamotte, is a[lmost] stereoscopic, and this gentleman's pictur[es are] all to be well spoken of. There are (188) [Lau]sanne, which we rather suspect of p[ainted] clouds, (288) High-street, Oxford, much su[perior] to his stereoscopic views of that city. The visitor should compare this with No. 138, [the] Water Colour Gallery, a drawing by [Mr. A.] Pugin. While speaking of Mr. Delamot[te, we] wish to call attention to his series of Re[collec]tions of the Manchester Art Treasures E[xhibi]tion, of which honourable mention may be [made].

ll printed, every local photographer ought ossess a portfolio of these. Mr. White's ires are all good photographs. We wish could say as much for his prints, some hich we have noticed to be in a state of rioration from fading. He shows a first- view of a Watermill (190), The Decoy (189), ies from Life (178) and (244); also (373), a of the Crimea—these three have all the back-ground of foliage, which is very l. In (228) Wotton House, we think he attempted too much in endeavouring to the whole precincts of Mr. Evelyn's e; the print is of an unpleasant colour, usual with this artist. Mr. Fenton's ires may be identified anywhere; they are st to be distinguished as well from any artist's as a Rembrandt would be in a col- on of Claudes or Poussins. An extensive p of scenery such as (187) Reach of the Dee, aracteristic bit of ancient architecture, as Roslin Chapel, a picturesque mill (247), a rfall (500), a River's Bed (508), the Garra- (518) a Romantic Bridge—all these are lent examples of photography on a large , and some in which a degree of ingenuity taining a position must have been required. Llewellyn sends some very good pictures, ome of them may be very favourably con- ed with others. His views of Penllergare 512, 516) are much superior to No. 566 of same by Mr. Knight, and to 305, by Mr. notte. Mr. Llewellyn's 177, On the Tees, ery good study of rocks scattered about in id stream. We think 365 and 369, On the rf and Tenby Bay, must be early attempts is artist. The comparisons between the ent views of Penllergare will afford good rations of our opening remarks. Σ.

STORY OF PHOTOGRAPHY. THE CALOTYPE LBOTYPE.—Mr. Talbot, in the introduction work, "The Pencil of Nature," published 44, wrote thus modestly respecting the— at this day—very beautiful photographic rations which accompanied it. "They are ssed by Nature's hand, and what they as yet of delicacy and finish of execution chiefly from our want of sufficient know- of her laws. When we have learnt more perience, respecting the formation of such es, they will, doubtless, be brought much r to perfection; and though we may not be to conjecture with any certainty what they may hereafter attain to as pictorial ctions, they will surely find their own e of utility, both for completeness of detail orrectness of perspective." In apologising me imperfections to be found in some of lates, Mr. Talbot observes: "That such fections will occur in a first essay must d be expected. At present the art can y be said to have advanced beyond its y—at any rate it is yet in a very early —and its practice is often impeded by s and difficulties, which, with increasing ledge, will diminish and disappear. Its ess will be more rapid when more minds evoted to its improvement, and when more lful manual assistance is employed in the ulation of its delicate processes."

THE COLODIO-ALBUMEN PROCESS.*

By William Ackland, Esq.

[Concluded from page 138.]

COATING WITH IODIZED COLLODION.

Before proceeding to coat the plate, it is necessary that the iodized collodion should have been allowed to stand for an hour or more, so that any floating particles may fall to the bottom; and in all cases the dust and dried crust of the collodion which may adhere to the neck of the bottle must be carefully removed, otherwise spots or stains will be produced on the plate.

If particles of dust are floating in the air of the operating room, it will be useless to attempt to coat a plate, as they will deposit themselves on it and serve as a nucleus for a stain in the after-process. For this reason it is recommended to clean the plates in another room, so as not to disturb the atmosphere of the operating room from this cause.

Having ascertained that the glass plate is perfectly clean, pour on the iodized collodion to coat the plate in the usual manner. As soon as the film has set, plunge the plate into the nitrate bath, where it should remain one minute undisturbed. Now remove the plate two or three times for a moment until the surface is uniformly wetted; then place the plate on a levelling stand and pour over it a gentle stream of common water, so as to remove *as much as possible of the bath solution* from the surface. The plate is now removed from the levelling stand, the back well washed with water, and then placed nearly upright on filtering paper with the face against a wall, for *one minute*, to drain, and it is then ready to receive the albumen coating.

COATING WITH ALBUMEN.

When the glass plate has been allowed to drain one minute, the plate-holder is again attached, and iodized albumen is poured over the surface so as to cover every part; then drained off, *and again poured* on and off *three or four times;* ultimately, drain off as much as possible of the excess of the iodized albumen, and place the plate nearly upright against the wall, with the coated side inwards, to dry *spontaneously, as the albumen coating, if dried by artificial heat, becomes so hard that the plate is not fully acted on by the nitrate bath, and is consequently far less sensitive.* The iodized albumen must be filtered just prior to being used; one ounce will coat ten plates, and what remains should be thrown away, as it will have become too diluted to be effective.

In coating with albumen, the presence of air-bubbles or dust must be guarded against. The former can easily be done by taking care, in pouring the albumen into the measure and on the plate, not to pour so as to generate air-bubbles in the liquid. But should any be detected, hold the plate horizontally, and give it another coating of albumen, then incline the plate so that the bulk of the liquid shall pass over and carry off the bubbles with the running stream. Dust on the plate must be prevented by operating in a room as free from this photographic enemy as possible.

In order to render the coating of albumen as

uniform as possible, the plate must stand to dry on two or three layers of filtering paper, and the upper surface must touch the wall at *one point only*, and not be allowed to rest against it along its entire upper edge.

When the albumen coating is *thoroughly dry* (and not till then), the plate is ready to be excited; but if more have been prepared than are likely to be used for taking pictures on during the next ten days or fortnight, they may be stowed away in a plate-box, ready to receive the sensitive coating at any time, as these albumenized plates will keep good for months, and are not injured by light.

EXCITING THE PLATE.

Prior to the plates being excited, they must be *thoroughly dry*, and free from any particles of loose dust on the surface, back, or edge. The bath solution, filtered through paper, may be used in either a flat or a vertical bath. The plate is to be immersed for a minute, raising and depressing it two or three times, and then removed and placed on a levelling stand, and a stream of water allowed to fall on its surface for half a minute, so as thoroughly to remove every particle of the bath solution. When the plate is thoroughly washed it is placed against the wall of the dark room to dry. The plate having been allowed to dry (which takes place in about half an hour), is ready for immediate exposure in the camera, or may be stowed away in a plate-box and kept at least a fortnight before being exposed; and it is a fact worthy of note, that plates that have been kept a fortnight are equally as sensitive as those just excited.

EXPOSURE IN THE CAMERA.

This operation may take place immediately the plate is thoroughly dry, or a fortnight may intervene, provided the plate be kept very carefully from the light and from any sulphurous or other chemical vapours. A mahogany plate-box is to be preferred [or Mr. Crookes's, of tin-plate], as the vapour given off by deal-wood injures the sensitive plates.

The time of exposure in the camera of course varies with the lens and light; but it may be mentioned, that with a Horne and Thornthwaite's stereoscopic lens of $4\frac{1}{2}$ in. focus and $\frac{3}{8}$ in. aperture, about half a minute will be required in the full sunshine of summer, three minutes in the sunshine of winter, about two minutes in the summer without sunshine, and ten minutes in winter; *but at all times expose for the deepest shades*, as the high lights are but injured by over-exposure.

DEVELOPING THE IMAGE.

The plate on being taken into the operating room is placed on a levelling-stand, and distilled or filtered rain-water poured over it for half a minute, so as completely to moisten the surface and remove any particles of adherent dust; then drain slightly, and pour over its surface gallic acid solution, so as to cover every part; allow this to remain on one minute, then drain off, and cover the plate with a mixture made by adding one drachm of silver developing solution to three drachms of gallic acid solution (made and filtered as before described). *Pour on and off repeatedly so as thoroughly to moisten every part of the plate*, then allow it to remain on the pl until the general outline of the picture appe This generally occupies about one min although sometimes much longer. Now p off the developing solution, and examine plate to ascertain if any stains are appar should such be visible, they may be ca removed *at this stage* by carefully brushing surface with a camel's-hair brush. When is effected, again pour on the developing s tion, and allow it to remain until the pictur fully brought out and the high lights are s ciently intense. On this being accomplis drain off and thoroughly wash with water. picture is now ready for the next operatio fixing the image.

Should the developing fluid become mu pour it off, well wash the plate, and conti the development with fresh solutions mad before; or should no appearance of the pic take place after three minutes' applicatio the developing mixture,* use equal part silver developing and gallic acid solutions. general a good picture takes from a quart half an hour to develop, and the conditio the sky will serve to indicate whether proper amount of exposure has been given. under-exposed picture has a dense sky, but details in the deep shades are deficient; wl as, in an over-exposed picture the details well out, but the sky is transparent and g rally of a reddish tint; such pictures, more possess no contrasts of light and shade; wl as, when the proper amount of exposure been given, the sky is perfectly opaque, middle tints finely developed, and the de apparent in the deepest shades, with pe contrasts of light and shade. I cannot pa to the next step without giving a ca against the use of imperfectly-cleaned mea and vessels to contain the developing f these are constant causes of failure, and be carefully avoided.

FIXING THE IMAGE.

The plate having been thoroughly freed m the developing fluid by washing, is plac on the levelling stand, and the surface co ed with fixing solution. In a minute or tw he yellow opalescent colour of the film wil is-appear; and when this occurs, well wash ith water, and lean the plate against the w to drain and dry. The surface, when dry, is fficiently hard to resist any *slight* violence ut as a further protection, warm the plate sli tly all over near a good fire, then pour over it ur-face Horne and Thornthwaite's negativ ar-nish in the same manner as collodion is ap ed. Allow the superfluous varnish to drain ack into the bottle; hold the plate again befo the fire until the whole of the spirit is evap ted, and, when cold, the plate is ready to be p ted from, so as to produce any number of p tive pictures, either on paper or glass, as he fter described.

A negative picture sometimes require o be "touched," in order to give an inc ased opacity to the sky; this may be easil lone

* If the temperature of the operating room is allow o fall below 60°, the development proceeds more slowly, even ceases altogether. In such cases heat the developing tions to about 100°, and renew as often every five minutes unt e picture is developed.

th indian ink, ground on a plate with water to ıich a few drops of albumen have been added. To print from the negative, and produce sitive transparent slides for the stereoscope, ɘpare the glass plates exactly as for the gative picture, and proceed in all other spects according to the usual methods of sitive printing by superposition. Develop d fix the positive in the manner described for gatives.

REDUCTION OF SILVER BY ESSENTIAL OILS.— The operation of coating glass with mercury attended with serious detriment to the health the workmen, from the vapours of the merry; it also requires very considerable time for mpletion, and is subject to frequent miscarge. The plates often break under the presre of the weights with which it is necessary load them; drops of mercury sometimes flow wn and carry the amalgam with them, when e silvered mirrors stand on end, giving rise to rved streaks (worms), and the amalgam is ble to spoil by crystallization or carriage. ıe process for silvering mirrors, proposed by ayton, and tested by Faraday and Warington, free from all these defects. The silvering id is obtained by mixing ammonia with nitrate silver, filtering the mixture and adding to it alcoholic solution of oil of cassia.* This id has the property of depositing bright melic silver, on the addition of the *reducinguid*, which consists of a solution of one part of cloves *(ol. caryophyllorum)* in three parts cohol.† In order to silver a mirror by this ocess, a perfectly clean plate of glass is surındedby a rim of putty, and a layer of silvering id, one or two lines in depth, is poured upon As soon as the solution of oil of cloves is ded, a film of brilliant metallic silver attaches elf firmly to the surface of the glass, and this kes place with a rapidity proportioned to the antity of the solution that is used. The ıting succeeds best when the reduction proeds slowly, and is produced by a very few ops of the solution; from six to twelve drops e sufficient to cause the precipitation of four d a half ounces of the solution of silver, and e film of metal is so thin that a square foot of only weighs from twelve to eighteen grains, fact, the value of the silver covering a surface ten by five feet, varying from $\frac{1}{2500}$ to $\frac{1}{1700}$ of ine in thickness, does not exceed from seven ten shillings. It is obvious that the principle the process consists in deoxidizing the oxide silver by means of the volatile oil, and this is fected *without any evolution of gas* which might stroy the continuity of the metallic surface. ıe nitrate acid remains in combination with e ammonia.

Notwithstanding the apparent advantages of e process, it has not been carried out extenvely by the manufacturers of mirrors into whose nds the process has been transferred, and this probably due to the difficulty of obtaining a rfectly clear unspotted surface of any conlerable extent.—*Knapp's Technology*.

* One ounce of nitrate of silver, three ounces of alcohol of 87 cent., and twenty to thirty drops of oil of cassia, form the xture.

† Formic or aldehydic acid might perhaps be conveniently ıstituted for this mixture.

THE DRY COLLODION PROCESS.

By Charles A. Long, Esq.*

THE COLLODION.

This being the principal material we have to use, we must exercise great care in the selection of a sample that possesses all the characteristics which fit it for a dry process. We must reject all samples that possess great tenacity and contractile power: the collodion must not be too thick, and it must flow evenly over the plate, and not set in ridges. The best condition for the iodized collodion is that known as *powdery*, that is, being spread on the plate and partially dry, it cannot be removed as a film, but crumbles up on being pressed by the finger in its passage across the plate; in fact, such a condition as would arise from using gun cotton prepared with acids at a high temperature.

The following formula will be found to answer most admirably :—

Gun Cotton ....60 grains.
Absolute Alcohol.................. 5 ounces.
Sulphuric Æther, sp. gr. ·730...15 ounces.

This cotton is to be shaken up with the mixture of alcohol and æther, and when dissolved, the bottle containing it must be stood aside, in order that any undissolved particles of cotton may subside. The clear liquid may then be decanted into a clean bottle for use.

The Iodizing Solution that I have found to give the best results in this process is made in the manner following :—

Absolute Alcohol .... 8 ounces.
Iodide of Cadmium..............64 grains.
Iodide of Ammonium...........64 grains.

The iodides are to be dissolved by agitation in the alcohol, and the resulting solution is to be carefully filtered, and preserved in a well-stoppered bottle.

The Iodized Collodion consists of—

Iodizing Solution...... 2 drams. }
Plain Collodion......... 6 drams. } 1 ounce.

The collodion should always be iodized at least twelve hours before it is required; this interval allows any insoluble matters either from the iodizing solution or from the collodion itself to fall to the bottom, and enables the operator to pour off the clear solution into a perfectly clean bottle for use.

Next in importance to the iodized collodion comes

THE PRESERVATIVE SOLUTION.

Some care is required in the preparation of this solution, in order that it may be clear and bright when finished, and not contain particles that would be deposited in its passage over the collodion film when being used. The chief precaution to be observed is *not to allow it to boil too rapidly, and not to conduct the operation over too fierce a fire;* attention to this will prevent many failures, and ensure a solution in every way suited for the process.

Take 200 grains of the best transparent gelatine, cut into small shreds, and throw it into a pipkin in which has been previously placed ten ounces of distilled water; set this on a slow fire, or over a lamp, until the gelatine is completely melted; then weigh out 100 grains of

* Published by Bland and Long, Fleet street, London.

pure citric acid, and dissolve it in two ounces of distilled water; add this to the solution of gelatine, stirring it during the addition with a glass rod. The solution in the pipkin is now to be gently boiled until half of it has evaporated; this should be in about fifteen minutes: remove it from the fire, and add sufficient distilled water to make up the bulk of liquid to twelve ounces. When quite cold, the liquid in the pipkin is to be filtered through two thicknesses of pure white blotting paper into a bottle perfectly dry and clean. We now add to every twelve ounces of filtered preservative solution, one ounce of alcohol, of the specific gravity of ·840.

The solution thus prepared is ready for use, and should be of a pale amber colour, without any signs of insoluble particles floating in it; should any appear after it has been prepared for some days, a second filtration will remove them, and render the liquid again bright and clear.

It will be found better to prepare this solution only in the quantity indicated above, unless the consumption be large; for, although it will keep good for a week or more, my experience points to the fact, that the most successful results follow the use of preservative solution freshly prepared.

THE NITRATE OF SILVER BATH.

The bath for rendering the plates sensitive does not differ from that recommended for taking negatives with wet collodion. The formula for its preparation may not be out of place, however, and may assist those whose knowledge of the matter is not perfect.

Nitrate of Silver (fused)...... $1\frac{1}{4}$ ounces.
Distilled Water..................10 do.
Iodide of Cadmium............ 3 grains.

Dissolve the nitrate of silver in the water, and then add the iodide of cadmium; thoroughly agitate the mixture for five or ten minutes, and then add $\frac{1}{2}$ ounce of alcohol, sp. gr. ·840, and ten ounces of distilled water; further agitation, and subsequent filtration through two thicknesses of white bibulous paper, will put us in possession of a negative bath. The nitrate of silver being fused, and, consequently, pure and neutral, and as it is essential to obtain clean pictures that the bath should be slightly acid in its reaction, we find it necessary to add five or six minims or drops of PURE glacial ascetic acid to a bath of twenty ounces, in order that the above condition may obtain.

THE DEVELOPING SOLUTION

Is very simple in its nature, being merely a saturated solution of gallic acid in distilled water, to which has been added a small proportion of alcohol of sp. gr. ·840.

The exact formula is as follows:—

Distilled Water ....20 ounces.
Alcohol sp. gr. ·840 .... 1 ounce.
Gallic Acid .... $\frac{1}{2}$ ounce.

The gallic acid will not be entirely dissolved, but that left at the bottom of the bottle will ensure the solution being saturated; it is better not to filter the developing solution until it is required for use, as it is preferable to allow it to stand over an excess of gallic acid, than for it to be withdrawn after a slight agitation with the crystals. It is a great error to suppose that we obtain a saturated solution of gallic acid b merely agitating the crystals with water for few moments.

The developing solution, prepared as abo directed, will keep good and in working ord for some weeks; but when it becomes of a da colour it would be safer to reject it and prepa a fresh quantity than to run the risk of a failu from an impure and imperfect developing agei

NITRATE OF SILVER SOLUTION,

For adding to the gallic acid during develo ment is composed of

Fused Nitrate of Silver ....30 grains.
Distilled Water .... 1 ounce.

THE FIXING SOLUTION

Consists of a solution of hyposulphite of soda water (filtered), in the following proportion:-

Hyposulphate of Soda in crystals... 8 oz.
Rain or Filtered Water ....20 oz.

PARCHMENT PAPER.—It had been long kno and published that sulphuric acid was capa of modifying the *cellulose* which constitutes t basis of the tissues and fibres of all trees a plants. What Mr. Gaine has done is to asc tain by a set of carefully conducted experime the exact strength of the acid required, and t various conditions which conduce to succe This being understood there is no ground charging Mr. Gaine with experimental pla arism. "He," in the words of the Rev. I Barlow, "succeeded in discovering that wl paper is exposed to a mixture of two parts concentrated sulphuric acid (sp. gr. 1·854 thereabouts), with one part of water, for longer time than is taken up in drawing through the acid, it is immediately conver into a strong tough skin-like material. traces of the sulphuric acid must be instar removed by careful washing in water. If strength of the acid much exceeds or falls sh of these limits, [the cellulose of] the pape either charred or else converted into [a solu substance] dextrine. The same conversion i dextrine also ensues if the paper be allowe remain for many minutes in the sulphuric a after the change in its texture has been effect The strength thus imparted to feeble blotti paper is shewn by the fact that "a ring sev eights of an inch in width, and weighing more than 23 grains, sustained 92 lbs., a stri parchment of the same dimensions suppor about 56 lbs." Parchment paper absorbs wa but does not allow of filtration through texture; it shrinks without alteration weight; it is not more combustible than changed paper of equal substance; it is soluble in potash; is not disintegrated by w like common paper, and, unlike animal p ment, it is not decomposed by heat moisture. It is possible that a chemical a may be the cause of its physical condition. It has been supposed that the sulphuric acid bines with the cellulose for an instant, to fo substance which the washing water decomp Dr. Warren De la Rue, and Dr. Müller engaged in researches on these obscure pc It is believed that this paper will be usef the bookbinder, the printer, the law stati and perhaps to the artist and photographer.

GLYCYRRHIZINE IN NEGATIVE COLLODION.

By F. Hardwich, Esq.

r a meeting of the London Photographic iety in December last, a paper was read upon odion, iodized with the alkaline iodides, in ch the changes which it experiences by ping were partly explained, and the effects duced by these changes dwelt upon at length.

But independent of the iodized collodion re are decompositions continually taking e in plain collodion, and also in the exciting h, minute in quantity, but sufficient to alter character of the picture. The collodion pro- cannot be said to be perfected until means e been devised of imitating these changes ficially, so that all the solutions may be pre- d at once in a state fit for use. By the nulæ at present given, this cannot be done. ertain kinds of photography, ordinary collo- is not adapted for the purpose until it has ergone alterations by keeping.

The employment of glycyrrhizine, the essen- principle of liquorice root, is proposed as a ns of readily conferring intensity upon col- on. It is now more than a year since I first ame aware of the peculiar properties pos- ed by this organic body, but as the whole ect of intensity is difficult, and requires very ful investigation, it was thought better to until a long experience had proved the tical value of the process.

The following experiments will suffice to w that glycyrrhizine is a substance which an influence in photographic processes. e pure chloride of silver, precipitated from ess of the nitrate, and expose it to light; it change from white to violet-blue. Repeat trial with a second portion to which glycyr- ine has been added: the violet-blue colour then be replaced by chocolate brown. Gly- hizine, therefore, belongs, photographically, he same class of bodies as albumen and gela- . Again, if glycyrrhizine be added to solu- of nitrate of silver in minute quantity, no ipitation at first occurs, but on exposure to ight, a flocculent red substance gradually rates, which contains organic matter com- d with silver, and is closely analogous to red albuminate of suboxide of silver, so ned. Now, we know that, as a rule, sub- ces which have a colorific action on the kening of chloride of silver, possess a similar t in the development of the invisible image odide of silver. Hence both albumen and atine give an image differing from the image pyroxyline, which is a body nearly or quite t to the salts of silver. By associating oxyline with glycyrrhizine, we have a porting basis which corresponds nearly to umen in possessing both a mechanical and mical action. Portions of the sugar-resin, so ute as almost to escape observation, when ed to the collodion, alter the character of image, imparting to it, under favourable cir stances, a brownish-red translucency with a yellow creaminess by reflected light.

With these preliminary remarks we dismiss theory of the subject, and proceed to describe mode in which the glycyrrhizine is to be used.

"A pure collodion is first made, iodized with iodide of cadmium. This preparation is stable and will preserve its properties nearly unchanged for many months. Next, glycyrrhizine is dissolved in strong alcohol, in the proportion of five grains to the ounce; and also iodine in similar quantity. With these three solutions any description of collodion photography can be performed.

"I proceed to give more minute directions.

"1st. *Collodion negative portraiture.*—The operator should commence by taking a trial picture with the pure collodion untouched. The sensitiveness will be very great, but it may happen that the image developes somewhat slowly, and of a blue tone, particularly if the nitrate bath contains free nitric acid, or if the light is bad at the time of taking the picture. Both these points should be noticed, as they will certainly affect the result. An old and brown collodion often gives abundant intensity, even in a bath containing free nitric acid, but with a pure collodion, nitrate of silver from which the acid has been expelled by fusion should always be used. Supposing the bath, however, to be correctly made, the intensity of the image will not be so great on first mixing it, as after the lapse of some months, when partial decomposition has taken place.

"With regard to the second point mentioned, viz., the state of the light at the time of taking the picture, the rule is, that the greater the actinic power, the less the chance of any organic addition to the collodion being required. The same solutions which have been tested in the open country, and found to produce brilliant negatives, will often fail to do so when worked in the smoky air of a large town. The condition of the film must be different under the two circumstances to produce a similar result.

"When the glycyrrhizine is employed for portraiture, two drops, equal to one minim, of the solution, or to about $\frac{1}{100}$th of a grain of the solid resin, will often be sufficient for an ounce of the collodion; anything beyond that would probably give too great density, and destroy the half-tones in the face. Much, however, will depend upon the light, and in a glass-house in London, during the winter months, four drops, equivalent to two minims, may be used without any very obvious effect. Gradation of tone being of extreme importance in portraiture, all organic additions must be made cautiously, or a hard and severe picture with obliteration of the folds in white drapery will be the consequence.

"The addition of a few drops of nitrate of silver towards the end of the development hastens the process of intensifying the negative, and it will be observed that the organic matter in the collodion has a beneficial effect in facilitating the second deposition of silver.

"Taking six seconds as an average time of exposure for a negative portrait in a good light, allow eight seconds in the camera after the addition of the glycyrrhizine.

"The collodion for negative portraiture may be used neutral and colourless, but if, from diffused light in the camera and developing room, or a faulty state of the chemicals, the image should develope misty, two or three drops of the solution of iodine will prove a remedy.

"2ndly. *Landscape Photography.*—The pure collodion sometimes succeeds, but as a rule an addition will be required. With an old nitrate bath which has been mixed for twelve months or longer, full intensity is often obtained, but not so easily in the case of a new bath. During frosty weather, when the air is clear, negatives may be taken of considerable density with the simple collodion, but in a misty atmosphere the development is feeble. Three, or at most four, drops of the solution of glycyrrhizine to the ounce of collodion is the quantity recommended.

"If the finished negative, on being held against the light, appears too red in the skies, push the development a little further, or drop the solution of iodine into the collodion until it assumes a yellow tint. As this addition diminishes the sensitiveness of the film, it should only be made when the light is strong. In a weak light the iodine would lower the intensity considerably, and render the image blue and metallic.

"At the present season of the year, the time of exposure in a small stereoscopic camera, with a lens of $4\frac{1}{2}$ inches focus, and $\frac{1}{4}$ inch diaphragm, is about ten to twelve seconds, after the glycyrrhizine has been added to the collodion.

"On comparing together negatives taken with and without the addition of the glycyrrhizine, the difference was seen principally in the skies, the foliage and other dark objects being nearly similar in each. Hence it is evident that the sugar-resin acts by giving a sufficient intensity under the influence of a powerful light acting upon the film.

"3rdly. *Copying Prints, &c.*—In this case the organic body acts very beneficially, increasing the rapidity of development, and giving density to the blacks. An addition of free nitrate of silver will be needed towards the end of the development, but far less than when the glycyrrhizine is omitted. The stronger the light the more evident will be the effect produced by the organic matter, and hence the print to be copied should, if possible, be hung in the open air, and a lens of large aperture and short focus employed when practicable. With a long focus lens and small diaphragm, if the day be dull and cloudy, the negative will develope feebly in spite of the glycyrrhizine.

"The time of exposure with a single lens of 20 inches focus, and $\frac{1}{2}$ inch diaphragm, to copy prints of the same size as the original, will be about thirty seconds, if the sun shines directly upon the picture. Three or four minutes may be occupied in the development, and the finished negative will be brown or purple by transmitted light.

"*General Remarks.*—To ensure success in the employment of the liquorice sugar, the following points should be attended to.

"First, add the sugar to the collodion, if possible, a few hours before use; the increase of intensity will then be more decided.

"Secondly, the glycyrrhizine must be in a state of chemical purity, or it will dissolve in the collodion only partially, and spots will result. In the liquorice root it exists in combination with bases, lime, and ammonia, in which state it is soluble in water, but insoluble in alcohol. When separated from the bases, by means of sulphuric acid, it dissolves easily in spirits, but only to a small extent in water. In addition to glycyrrl zine, the root contains other principles whi interfere with the result, and must be remov by digestion in strong alcohol. Alcoholic sol tion of glycyrrhizine is rendered darker in colo and partly decomposed by evaporation at 21 but at ordinary temperatures it may be pr served for several months in a state fit for ph tographic use.

"The quantity to be added to the collodi must be kept nearly within the prescribed limi or the sensibility will be much impaired, and t dark parts of the object imperfectly rendered, pr ducing a chalky print. When too much of t sugar is used, the formation of the sensitive iodi of silver will also be interfered with, so tha collodion which ought to give a yellow film w produce only a blue and smoky layer, quite u less for negatives. This point having b reached, a further addition of glycyrrhizine together prevents the precipitation of the iodi so that the plate remains clear and transpar in the bath. No experiment could show m conclusively than this the important influe which organic matter may exert upon the p perties of the salts of silver.

"After the addition of the liquorice sugar, t sensitiveness of the collodion decreases slo by keeping, so that at the expiration of six we or two months double the original exposure n be required, the intensity remaining nearly affected. There is also after a time a tende to gelatinize the collodion, which must be avoi by using pyroxyline of the variety which gi a fluid condition, sticking to the glass and d ing free from crapy lines.

"Methylated spirits cannot be used either solvents for the glycyrrhizine or in the collodi they appear to have a chemical action, at f adding to the intensity, but afterwards gre diminishing it. The collodion is also more li to become glutinous than when made from p spirits.

"The collodion should be iodized with iodide of cadmium only. When the alka iodides are employed the effect first prod appears to lessen by keeping. Alkaline iod s are also frequently contaminated with carbo and carbonated alkali acts chemically upon e glycyrrhizine, rendering it insoluble, and ducing specks and pin-holes in the nega Pure alkaline iodides may, however, be emplo l, if conjoined with a portion of bromide. is collodion gives great intensity in a strong li but in a weak light the image is feeble, bro e of silver being less sensitive than the iodid

"Before introducing the glycyrrhizine, st the collodion with litmus paper. If iodized h iodide of cadmium the reaction should be l, but it is sometimes alkaline from the comm al spirits containing free ammonia (?), and in at case acetic acid must be added, or the i ge will be red and feeble in a strong light.

"Hyposulphite of soda is better than cy de of potassium for fixing the negative; the l er sometimes exercises a solvent action, an d- dens the image. The organic matter in th ol- lodion alters the character of the image nd renders it more soluble in a solution of cy de of potassium.

"No apprehension need be entertained hat

ıe nitrate bath will suffer injury from the use f glycyrrhizine. Baths made a year ago, and 'hich have been employed largely with collo-ion so intensified, are still in good working rder. The liquorice sugar may even be added ı substance to the bath without causing fog-ing, and as the effect of giving intensity is roduced in this way, it may prove in some cases) be the best process. Difficulties occurred at rst in carrying out the idea, but these have ow been overcome, and if further trials should onfirm the result at present obtained, glycyr-hizine in the bath will partly supersede the ddition of the same material to the collodion.

"The employment of the glycyrrhizine in the aths allows the use of collodion iodized with ıe alkaline iodides, which for plates exceeding 0 by 8 inches is an advantage. The principal, nd, perhaps, the only, objection to the salt of admium as an iodizing material, is that it tends) glutinize the collodion, and to produce a ıickening towards the lower edge of the film. 'his may be obviated to a certain extent by ıreful manipulation, but on very large plates a oolly appearance will be seen in the skies and ırk parts of the negative, unless the collodion applied skilfully.

"The addition of an equal bulk of collodion, repared from the same pyroxyline, but iodized ith iodide of potassium or ammonium, increases ıe fluidity, and produces a mixture more suit-ɔle for the purpose."—*Journal Photo. Soc.*

AMATEURS' COLUMN.

Photographic Paper.—Some general remarks spepecting the varieties of paper whieh have een, or may be, employed in photography ill probably be useful to those who are about) make their first essay in the photographic t. That paper can be had of various sizes, ıicknesses, and qualities is well known. That ıese papers may be divided into "machine ıade" and "hand made," is again known to ıany readers; and that there exists a distinction etween Foreign (chiefly French and German), nd English made papers is well known to hotographers. This is not the place to go ıto full details respecting the manufacture of aper, but the writer having had the oppor-ınity of superintending the entire process of ıe conversion of "a batch" of pure linen fibre ıto some ten or twelve reams of photographic aper, may perhaps be excused if he digresses little in this direction. The fibre was taken ı the form of *new* linen cloth, because, in the rocess of weaving, it loses the greater part of ertain husk-like particles (called "sheave,") 'hich cling to the true fibre, and disfigure it y their harshness and yellow colour; if the repared flax could be obtained free from this efect, the expense of spinning and weaving 'ould of course be saved, and I am not at all ure that we shall be content until we can get ax fibre directly converted into photographic aper, paper for water-colour drawings, and hemical filters for analyses. The linen cloth 'as torn into strips, and then cut by a vertically xed knife into squares of three or four inches ach; with inferior materials it is sometimes ustomary to boil the cut pieces with lime, soda, r other alkali; but I was advised to allow this to be omitted, in consequence of the good and clean condition of the material: I regret that I followed the advice, although it was honestly given—we shall subsequently learn the reason why. In dealing experimentally with a manu-facture, the principles of which are not soundly ascertained or understood by the manufacturer, one should insist upon having carried out every practicable suggestion that science can make; for it is clear that uninstructed workmen, however skilful in their own way, are not competent to condemn a suggestion that springs from purely chemical reasoning or experience: the suggestion may cause incon-venience, or be difficult of execution, still we must have it tried, or we must lose the fruit of the rest of our thought and labour. I dwell on this point, because manufacturers are gene-rally averse from changes, for which *they* cannot see a sufficient reason. This is especially true of paper-makers; they make only slight alterations where a thorough re-organisation is required, and I am of opinion that, with the present system, we shall never get a paper pure and uniformly good in texture and hard-ness. To return to our linen pieces; they were at once put into "the engine," a revolving machine, carrying a cylinder armed with parallel iron bars, which, in revolving, almost touch the grooved brass bed, which forms the bottom of the oval tub or tank, in which the rags or pieces, immersed in water, are torn or dragged till they become a mass of short fibres; water is allowed to flow through the engine during this "beating of the pulp," as the operation is termed, hence a great many very small particles escape through the grating placed in the water-way, occasioning a con-siderable loss of material. At the outset the distance between the iron bars and the brass bed is "set wide," but as the pulp becomes fine, this distance is lessened by an arrangement of screws specially provided: by diminishing this distance and prolonging the beating, the pulp can be got to any degree of fineness. Whether this pulp should be of short or of long fibre, and how it is next to be treated, we shall decide in our next.

Detection of Iodine and Bromine.—MM. Henry and Humbert have devised a new process "with the view of determining the presence of iodine in the waters of Vichy." "The water (or the more or less concentrated residue of its evaporation), is treated with acid nitrate of silver. The precipitate formed must contain the chlorine, bromine, and iodine of the water. It is washed and carefully dried. It is then intimately mixed with a little cyanide of silver, and introduced into a tube, at one end of which it is fixed between two plugs of wadding or asbestos. A current of very dry chlorine is then passed slowly over the mixture, whilst the corresponding part of the tube is slightly heated. The iodine, bromine, and cyanogen are displaced, combine and condense in the colder parts in the form of a white crystalline ring of iodide and bromide of cyanogen; the tube is then closed at both ends, and may serve in case of need as a piece of evidence. The physical and chemical properties of iodide and bromide of cyanogen do

not allow them to be confounded with other compounds; the iodide sublimes at 113°, and the bromide at 59° F.; this allows them to be separated mechanically by plunging the tube into water at 86° F.: the iodide and bromide give the principal characteristic reactions of iodine and bromine. Pure substances must be employed to furnish the chlorine required, and the apparatus should be set in action for some time before the commencement of the experiment; for this purpose, cyanide of silver alone is put into the tube; if no trace of iodide or bromide of cyanogen sublimes, the operation may be proceeded with."—*Chemical Gazette, No.* 352.

AN ACCOUNT OF A METHOD OF COPYING PAINTINGS UPON GLASS, AND OF MAKING PROFILES, BY THE AGENCY OF LIGHT UPON NITRATE OF SILVER.

INVENTED BY T. WEDGWOOD, ESQ.

*With observations by H. Davy.**

"WHITE paper or white leather moistened with solution of nitrate of silver undergoes no change when kept in a dark place; but, on being exposed to the daylight it speedily changes colour, and after passing through different shades of grey and brown, becomes at length nearly black.

"The alterations of colour take place more speedily in proportion as the light is more intense. In the direct beams of the sun, two or three minutes are sufficient to produce the full effect; in the shade, several hours are required, and light transmitted through different coloured glasses, acts upon it with different degrees of intensity. Thus it is found, that red rays, or the common sunbeams passed through red glass, have very little action upon it; yellow and green are more efficacious, but blue and violet light produce the most decided and powerful effects.†

"The consideration of these facts enables us readily to understand the method by which the outlines and shades of paintings on glass may be copied, or profiles of figures procured, by the agency of light. When a white surface, covered with solution of nitrate of silver, is placed behind a painting on glass exposed to the solar light, the rays transmitted through the differently painted surfaces produce distinct tints of brown or black, sensibly differing in intensity according to the shades of the picture, and where the light is unaltered, the colour of the nitrate becomes deepest.

"When the shadows of any figure is thrown upon the prepared surface, the part conceale by it remains white, and the other parts speedil become dark.

"For copying paintings on glass, the solutio should be applied on leather, and, in this cas it is more readily acted upon than when pape is used. After the colour has been once fixe upon the leather or paper, it cannot be remove by the application of water, or water and soa and it is in a high degree permanent.

"The copy of a painting, or the profile, imm diately after being taken must be kept in a obscure place; it may indeed be examined the shade, but, in this case, the exposure shou be only for a few minutes; by the light candles or lamps, as commonly employed, it not sensibly affected.

"No attempts that have been made to preve the uncoloured parts of the copy or profi from being acted upon by light have as y been successful; they have been covered wi a thin coating of fine varnish, but this has n destroyed their susceptibility of becomi coloured; and even after repeated washing sufficient of the active part of the saline matt will still adhere to the white parts of the leath or paper, to cause them to become dark wh exposed to the rays of the sun.

"Besides the applications of this method copying that have been just mentioned, the are many others; and it will be useful f making delineations of all such objects as a possessed of a texture partly opaque and part transparent. The woody fibres of leaves, a the wings of insects, may be pretty accurate represented by means of it, and in this case, is only necessary to cause the direct solar lig to pass through them, and to receive t shadows upon prepared leather.

"When the solar rays are passed through print and thrown upon prepared paper, the u shaded parts are slowly copied, but the ligl transmitted by the shaded parts, are seldom definite as to form a distinct resemblance them by producing different intensities of colo

"The images formed by means of a came obscura have been found to be too faint produce, in any moderate time, an effect up the nitrate of silver. To copy these imag was the first object of Mr. Wedgwood in researches on the subject, and for this purp he first used the nitrate of silver, which v mentioned to him by a friend, as a substa very sensible to the influence of light, but his numerous experiments as to their prim end proved unsuccessful.

"In following these processes, I have fo that the images of small objects, produced means of the solar microscope, may be co without difficulty on prepared paper; this probably be a useful application of the meth ; that it may be employed successfully, howe , it is necessary that the paper be placed at b small distance from the lens.

"With regard to the preparation of the so tion, I have found the best proportions thos of one part of nitrate to about ten of water in this case, the quantity of the salt applied to the leather or paper will be sufficient to enabl it to become tinged, without effecting its co position or injuring its texture.

* Journals of the Royal Institution of Great Britain, vol. 1, 1802.

† The facts above mentioned are analogous to those observed long ago by H. K. Scheele, and confirmed by Senebier. Scheele found, that in the prismatic spectrum, the effect produced by the red rays upon muriate of silver was very faint and scarcely to be perceived, whilst it was speedily blackened by the violet rays. Senebier states that the time required to darken muriate of silver by the red rays is 20 minutes, by the orange 12, by the yellow 5 minutes and 30 seconds, by the green 37 seconds, by the blue 29 seconds, and by the violet only 15 seconds.—*Senebier sur la lumière*, vol. iii. p. 199.

"Some new experiments have been lately made in relation to this subject, in consequence of the discoveries of Dr. Herschel concerning the invisible heat-making rays existing in the solar beams, by Messrs. Ritter and Böckmann in Germany, and Dr. Wollaston in England. It has been ascertained by experiments upon the prismatic spectrum, that no effects are produced upon the muriate of silver by the invisible heat-making rays which exist on the red side, and which are least refrangible, though it is powerfully and distinctly affected in a space beyond the violet rays out of the visible boundary."—*See Annalen der Physik, Siebenter Band*, 527.—D.

"In comparing the effects produced by light ɔon muriate of silver, with those produced ɔon the nitrate, it seemed evident that the uriate was most susceptible, and both were ore readily acted upon when moist than when y, a fact long ago known. Even in the twi- ght, the colour of moist muriate of silver read upon paper, slowly changed from white faint violet; though under similar circum- ances no immediate alteration was produeed ɔon the nitrate.

"The nitrate, however, from its solubility in ater, possesses an advantage over the muriate; ough leather or paper may, without much fficulty, be impregnated with this last sub- ance, either by diffusing it through water and plying it in this form, or by immersing paper oistened with the solution of the nitrate in ry diluted muriatic aeid.

"To those persons not acquainted with the operties of the salts containing oxide of silver, may be useful to state that they produce stain of some permanence, even when momen- rily applied to the skin, and in employing em for moistening paper or leather, it is cessary to use a pencil of hair, or a brush.

"From the impossibility of removing by ashing the colouring matter of the salts from e parts of the surface of the copy which have t been exposed to light, it is probable, that th in the case of the nitrate and muriate of ver, a portion of the metallic oxide abandons aeid, to enter into union with the animal or getable substance, so as to form with it an soluble compound; and supposing that this ppens, it is not improbable, but that substances y be found eapable of destroying this com- und, either by simple or eomplicated affinities. me experiments on this subjeet have been agined, and an aceount of the results of them y possibly appear in a future number of the urnal. Nothing but a method of preventing e unshaded parts of the delineation from ing coloured by exposure to the day is nting, to render the proeess as useful as it is gant."

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Dear Sir,—I shall esteem it a particular favour, you will please give me all the information you n on the following:—

1st—Please name a few materials that produce the ettiest backgrounds of a *dark* colour for collodion sitives.

2nd—My camera is not blacked inside. Is there y failures to be attributed to this omission in rking the collodion process?

3rd—Is there any paste or cement that you are are of for joining together the glass, mat, and pic- e in collodion positives, to prevent dust getting ween and keeping them from the air, &c. I have sted paper round a few, but I find this method ublesome, and often the paper will not stick to glass at all.

By inserting and replying to the above in your xt number for July 15th, you will much oblige.

Yours, very respectfully,

LILLY WHITE.

P.S.—In respect to the background, I may say t I have tried a great many different colours of th, and I am very sorry to say that they all pro- ce one dirty white colour.

[A reddish brown, or a dull sage green-coloured background is frequently employed. We have used a white calico screen so arranged that a black velvet curtain could be drawn over it after a given number of seconds of exposure, we thus get any shade from black to white. We prefer a very dark ground for the picture, and therefore do not fully appreciate your difficulty.

The camera must be blackened inside, and the lens should be shaded so as to intercept any strong light that may proceed from any part of the room not to be included in the picture.

Thin paper, coated with gum mixed with a little sugar, is used, and may be made to adhere and remain firm for many years; it should be varnished afterwards. We want some well devised plan of cementing in the picture; perhaps some of our readers will be good enough to aid in this enquiry. Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Can you give any particulars as to the method of taking those very minute photographs. I have seen a positive copy of the Lord's Prayer, that apparently, to the naked eye, was no larger than a pin head, yet when placed under a microscope every letter was sharp and clear. Pray, how is it done.—Yours, very truly,

Preston, July 4, 1857. AMATEUR.

[The words were written upon a blackened glass surface, size 3 inches by 4 inches, and the low power lens of a microscope used as the object glass of the camera, the copying being of course done by trans- mitted light, and upon collodion. It is a rather difficult art.—Ed. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

T. Clerk.—Add iodide of silver until no more is dissolved on shaking, a few grains are sufficient: filter off the clear liquid. You do not name your fixing solution: hyposulphite of soda should be used, and if all is done with care and cleanliness, no such result as that you describe can occur. For the negative process try a longer and a shorter exposure, and in developing try more or less nitrate of silver. It is often difficult to fix on the exact cause of failure in the absence of a knowledge of the exact procedure of the beginner.

X.—It is a pure assumption to say that gold replaces the silver of *the half-tints* of the ordinary positive print; finding a certain amount of gold in the finished print tells us nothing about its actual distribution; we then get into the region of proba- bilities and possibilities, and this does not satisfy us.

H. W.—Acetic acid, as it occurs in commerce, is very variable; this is much to be regretted, especially on account of the paper processes. An acid is sold expressly for the Talbotype; what does this mean? any pure acid should do for the Talbotype: we must learn why all acetic acid, reputed pure, will not answer for the paper process. The vendors of the *over*-pure acid prefers to keep, as a secret, the exact mode of its preparation: we shall be glad to hear the result of comparative trials made with various samples of acetic acid used on papers intended to keep 12 or 24 hours.

Corrugated Film.—See Mr. Hardwich's letter in this number. In a note in the *London Journal*, Mr. Hardwich says: speaking of the production of a smooth and glassy film, "the process I employ is to subject the paper, first to the action of diluted oil of vitriol, according to Gaine's method recently described, and afterwards to the nitro-sulphuric acid in the usual way, but at a comparatively low tem- perature."

P.Y.G.—The negative arrived so broken and rubbed that we could not decide upon its merits. It appears to have all the characteristics of a good albumen picture. A positive print should have accompanied the negative. We shall be glad to have another good specimen to compare with those obtained by other processes, when we will insert your letter, and our opinion thereof.

R.T.—"Actionic Photo." cannot be in earnest in requesting us to publish his letter. We thank him for his advice, and may probably review his suggestions in a future number.

CONTENTS.

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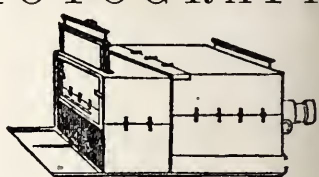

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

w Series.] No. 15.—AUGUST 1, 1857. [Price 3d. Stamped 4d.

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The

iverpool & Manchester Photographic Journal.

New Series. No. 15.—AUGUST 1, 1857.

'essor Wheatstone's stereoscope is still mbling block to those who will insist upon g their own hobbies before they have fairly d his. Owing our first knowledge of the ument and our first instruction in the art king pictures for the stereoscope to his ness, we naturally have a predilection for his s and intentions regarding the instrument; his even in mere matters of opinion where ct freedom of thought might properly be ed. And we act upon this predilection, use we are convinced by experiment and vation that Professor Wheatstone has be- d infinitely more of time and thoughtful upon the subject than any of those who nge his views or who criticise his labours. a meeting of the London Photographic ty, we lately, without assuming to speak authority, maintained the necessity of cer- rell known rules given by Professor Wheat- to those who ask his advice respecting ngular position and extent of separation of vo cameras. The few remarks we then have been so differently received in dif- quarters—having met with such alterna- of reception and denial, being so misunder- or misrepresented—that we feel it neces- o recur to the subject in order to notice r three objections.

James Ross, in a paper read before the graphic Society of Scotland, says, "Some that landscapes have not the relief of unless the lenses are kept apart in some proportional to the distance of the view he point at which it is taken; while others say that the separation of the lenses is immaterial, and that they may be kept together or removed six feet apart, the being still the same. If this opinion be t, then both the other modes are right as nd nobody is wrong; but unfortunately -feet mode will not do, as anybody may by taking a picture of a near object, say a g, and the distortion will be such that the ect would never recognise his own design; ter still, by taking a portrait of a man g, and you will find that the pipe appears rude fully as many feet as it should inches, the man's nose appears not very far be- in the race forward."

us examine this *modern* Athenian statement of the case. But first of all let us ask who are the "some" who insist that points of sight six feet apart give the "same effect" as points taken close together. Surely such an opinion as this ought not to have been brought forward as a contrast to be used against those who, from experimental investigation, say that the cameras must be separated "in some degree proportional" to the distance of the object; especially if from any reason whatever the operator is prevented from approaching the object near enough to view it under an angle that would *naturally* give the greatest appearance of solidity.

But we have *experiment* against experiment, and "unfortunately the six-feet mode will not do." This is disingenuous. Who ever proposed to separate the cameras six feet when "taking a picture of a near object, say a bulding;" or "better still," "a man smoking"! and of course placed so as to be "a near object.". Surely those who misstate the case in this way, unintentionally though it may be, do not deserve to have their statements considered for a moment. Of course the pipe protrudes as many feet as it should inches, to use the exaggerated phrase supplied to us; but pray what angle does your base line of six feet admit of in the supposed case of a near object? It may be 180°, when we should give you only a range of from 5 to 15°; for remember you have been told that the exact angle is, in reason, left to your own judgment—when dealing with objects which are partly in the foreground and partly at a distance.

A little farther on in Mr. Ross' paper we read that "Mr. Malone seems to have given up the whole argument in favour of 'the wide separation of the cameras,' when in the last number of the *Journal* he says it is not according to nature." What we said in substance was this: that no one could suppose that the views taken from points of sight wide apart represented in all their particulars any scene that could be witnessed, by the unaided eyes, from any one given point of sight. There was not much depth in the remark it is true, for the inference was an obvious one, and we were simply surprised that we had not already got credit for perceiving it. We had already designated the usual procedure as a compromise, and counselled the use of great judgment in determining the amount of separation; and finally insisted upon the impossibility of having near and far-off objects equally solid looking and equally free from distortion. This is not giving up the argument relating to the fundamental principle of the instrument, a principle which must in certain cases be strictly carried out in practice, let the

non-naturalists say what they will. We proposed a test object, a statue the size of life, placed on a square basis; and we now advise all who are still unsettled upon this question to get such a test, or any fitting substitute, and to take views of it under an angle of say ten degrees, or five if they prefer it, only let them them keep to the same angle as they recede from the object, and we are sure they will have no difficulty in deciding for themselves whether the rule here and elsewhere advocated is monstrous or not.

EXHIBITION OF ART TREASURES AT MANCHESTER.

Proceeding with our review of this collection, we come to a selection from the Crimean views, by Robertson, which are too well known to require much space for their notice. They have now all the interest of historical pictures, though we have chosen to place them in our classification among specimens of landscape photography. There are the Malakoff (580) (597) (594), the Barrack Battery (540), the Redan (581), Balaklava (573), Sebastopol (575) (577) (579), Traktir Bri ige (578)—all scenes fraught with the deepest interest, as stages in the drama of the late war; and then we have Constantinople (553) (548) (576), the city for whose preservation from the hands of Russia was one of the great objects of the war. Dr. Holden's specimens are very creditable, particularly (506) (520) Durham Cathedral, Midsummer and Midwinter. (499) Fountain's Abbey would be a good picture, but is disfigured by a yellow blotch, the plague-spot of photography, which seems to be a precursor of speedy dissolution. (501) Ludlow Castle is also a good example. (361) (363) are forest scenes, by H. M. Page, who would do well to avoid so much redness in his prints in future. A little attention in toning is very essential. Near these is a beautiful specimen from Switzerland (360); we do not know the locality. It is noticeable both for photographic beauty and the extraordinary character of the scene. Above a town, romantically situated on the banks of a rapid stream, spanned by several bridges high up in the air, stretches from hill-side to hill-side a wonderful suspension bridge, so light, that it seems of fairy construction. The picture has a great appearance of reality, and must especially interest those who have been in the locality itself. (176) Babbicombe Bay, by Batson, is an excellent study. (180) A Reach of the Don, and (181) the Brig o' Balgonnie are very fair, though the first is not well printed—they are by Wilson. (315) Aberdeen Granite Quarry; we wish this had been on rather a larger scale, somewhat more adequate to the immensity of the works it represents—it is also by Wilson. (192) and (219) are Le Gray's very remarkable pictures—photography never represented clouds better than here. (345) is a frame of similar views. H. Taylor contributes a number of his very useful pictures; (233) (234) (239) (240) (318) (319) are botanical specimens, which might well serve for an herbarium; (349) (350) (571) are Creswick-like bits by the same artist. We much admire a frame (268) of landscapes by Sir J. Coghill. The Castle of Heidelberg, and a shady rivulet, are very pleasing. (209) Chapel de St. Pont, which is one of those contributed by H. R. H. the Prince Consort, is a remarkably fine production. (2 Cottages at Trefriw, and (342) a Watermill, Mr. Mudd, are samples of waxed paper, we lieve, and are the only landscape photogra shown by Manchester. These two pict have many good points. Referring to (258), may as well correct a printer's error in our l which speaks of (204) in comparison with t as an example of photography much m agreeably told than in (258). It should h been "photographic truth," a pleasant and unpleasant way of telling which are illustra by these two views. By Mr. Turner, the a of (258), is also (259) The Church Oak, which we should like to see a picture in summer garb, Mr. Turner might with advant turn to waxed paper, in which we should ex great things from him. We are disposed, h ever, in spite of the merits of many of the f going, to award our highest praise to Leverett for his very beautiful pictures, (and (526), Stretton Park and A Suffolk Lane. all waxed paper operators succeeded like Leverett, the use of collodion for out-door w would soon become obsolete, except for ster copic pictures, for which we suppose it or s combination will always afford the most co nient medium. Of architectural photogra we have not many examples, and of these greater part are contributions from the contin We are not to be astonished at this, for tho the English landscape offers encouragemen the least enthusiastic, as well as satisfactio the most zealous, our public edifices are al universally so cribbed, cabined, and confine to deter any attempts at their successful nications by photography. There are, it is t many, very many exceptions; but in s instances, few and far between, even these to have escaped the attention of our p graphic friends. The Prince Consort has tributed nobly from his fine collection a s of views from Rome, Venice, and Paris, w are all so evidently good as to need no mendatory observations from us. There very few of the fine views by Bisson frères. are by no means so well represented as were in the excellent exhibition got up b Manchester Society last winter, where we great number of their pictures; and thoug certainly prefer novelty, we should have glad to have seen some of them again, and no doubt they might have been had for purpose. We hope on a future occasion E architecture will be better supported, a are glad to see already some prognostics coming to pass in the formation of an tectural Photographic Society in London.

Since writing the foregoing, we have ced four very excellent collodion positives Mr. H. B. Lee, of Liverpool; one, a view at en-head, is particularly good. The introd ion, of these pictures, however, appears to us her unsystematic. We are only glad to see hem on their own account; but if they were in ded to supply the manifest deficiency of the ibition in collodion pictures, we ask again, hat has become of one other which we saw the wall during the early part of the exhibitic and of some others which we know were contr uted for exhibition?

HORLTON PHOTOGRAPHIC SOCIETY.

second monthly meeting of this Society held at the Chorlton Town Hall, on Thurs- July the 9th, Mr. NICHOLSON in the chair. minutes of the previous meeting were read approved. An interesting discussion then place on the causes of the blistering of the lio-albumen film, and the formation of the te holes so generally found in the skies of negatives. Such a contrariety of opinion expressed upon both subjects, that but little nation of real practical value was elicited. y be worthy of remark, however, that a ber who has had considerable experience is process stated that he had but once had red plates, and the cause of this he at- tes to having prepared them in a damp ·, instead of, as usual, in a warm dry cn; his general success he believes to arise a careful avoidance of moisture. He tly warms the plates previous to the appli- n of the collodion, dries the albumen ng in a moderately hot oven, and returns lates to the oven after they have been sen- d and washed; he has manipulated thus a variety of collodions, and never had a red plate.

HEPWORTH read the following paper on *Chemistry of the Collodion Process"* :—

the many processes that have been devised eparing a surface sensitive to the influence ht, none I believe possesses so many ad- ges, for none is so delicately sensitive, ces such beautiful results, is so easy of ulation, and has consequently become so ar, as that discovered by the late Mr. Scott r, namely, the collodion process; and it is consideration of this that I desire to direct attention this evening. As I wish this unication to be as practically useful as le, it is my intention to allude but slightly omit altogether, such parts of the theory process as are but imperfectly understood, confine my observations to such practical s as I trust will be interesting to all.

enever great sensitiveness is required, er in the daguerrotype, calotype, waxed albumen, or collodion processes, the basis e, namely, the iodide of silver, a yellow r readily prepared by the addition of a e iodide to a solution of nitrate of silver. er this compound, when in a state of , is altered by light or not is at present a able question; and, therefore, in accord- vith the resolution I have adopted, it is y intention to repeat the various opinions have been expressed upon the subject. we have to deal with in due time, is that in contact with free nitrate.

ugh the processes I have named agree as basis employed, they differ as to the mode ch it is converted into a surface fit for the ses of the photographer; and the superior y of the collodion process is attributed o the film being used in a moist state than peculiar influence that may be exerted components of the collodion, though nay not be without their effect.

ccordance with the practical tenor of this I will commence with a description of the manufacture of collodion, afterwards explain the manner of making the sensitizing, developing, and fixing solutions, accompanied by such remarks upon the theoretical and practical action of each as I think may be interesting and useful.

Collodion, it may scarcely be necessary to observe, is pyroxiline, or gun cotton, as it is called, dissolved in a mixture of alcohol and æther. Pyroxiline itself is produced by the action of strong nitric acid upon lignine. Lignine is a definite compound, existing in various forms, and constituting, as its name denotes, the fibrous portion of wood. It is also the chief constituent of linen, cotton, paper, and other substances. Now, when cotton fibre, the body most generally used for the purpose, is submitted to the action of nitric and sulphuric acids a remarkable chemical change takes place, though its *physical* properties remain almost unaltered, for it has now become soluble in various liquids that previously had no effect upon it, more especially in having become soluble in alcohol and æther, as well as being highly explosive. Nitric acid is the agent that has effected this change; but as pyroxiline is soluble in comparatively weak, but not in strong, NO_5, sulphuric acid is added, which, having a strong attraction for water, abstracts a portion from the nitric acid, thus increasing its strength and preserving the pyroxiline from solution. Chemists are acquainted with what is called the law of substitution. By this law a portion of chlorine, or NO_4 peroxide of nitrogen, may take the place of H in a compound containing it, and that, too, without altering its appearance, or sometimes even its chemical properties. Gun cotton is a remarkable instance of this— $C_{12}\,H_8\,O_8 + NO_5 = C_{12}\,H_7\,NO_4,\ HO$. By a reference to the formula, it is seen that the 5th atom of O contained in the NO_5 takes one of H and forms H water O, the NO_4 then steps in to fill the gap which the atom of H has left. All this is done with so little disturbance that even the fibrous structure of the cotton remains as before. Such is the decomposition that takes place in the preparation of pyroxiline, yet the qualities of it may vary considerably; for instance, we may have a very explosive cotton that is insoluble in æther, a cotton that forms such a glutinous solution that an even film can never be obtained from it, and, next, a very soluble cotton that leaves on evaporation an opaque, rotten, and worthless coating upon the plate. These different varieties depend upon the strength of the acids used, and also upon the temperature of the mixture. If the nitro-sulphuric acid is too strong the cotton is highly explosive, but insoluble in æther and alcohol; if too weak the fibres are gelatinized and partly dissolved by the acids between their points, pyroxiline of various degrees of solubility and tenacity may be procured.

From the difficulty experienced in procuring nitric acid of a strength suitable for the purpose, the most convenient mode of preparing gun cotton is by the addition of sulphuric acid to dry nitrate of potash in fine powder. Nitrate of potash is an anhydrous salt; that is, contains no water; and when it is mixed with sulphuric acid, the latter having a stronger attraction for potash than is possesssed by nitric acid, it unites with it to form bisulphate of potash, and

the pure nitric acid is set free. When cotton wool or paper is immersed in this mixture, the nitric acid immediately acts upon it, and effects the change that I have already described. Many operators mix a small quantity of water with the sulphuric acid; this, however, in practice I find to be disadvantageous, as such a mixture frequently gelatinizes the cotton, or causes it to be partially dissolved. The mixture that I have found to be most successful is that recommended by Mr. Hardwich in his "Manual of Photographic Chemistry," namely 600 grains of nitre mixed with 12 fluid drachms of sulphuric acid, this is to be raised to a temperature of 130°, and tufts of cotton introduced, stirring occasionally with a glass rod for about five minutes; afterwards thoroughly wash and dry. If paper should be used instead of cotton, the immersion requires to be prolonged till it has remained in the mixture for 15 or 20 minutes. I may here remark that paper gives a tougher film than cotton, and is consequently preferable for the manufacture of negative collodion. I shall next have to call your attention to the solvent of the pyroxiline, namely the æther and the alcohol. These should be as pure as possible. The bad qualities of collodion, however, I believe to be more dependent upon the alcohol than the æther, unless the latter be evidently acid or changed by age and exposure to air. The reticulated appearance of the film produced by so many collodions, and which is so frequently a source of annoyance to photographers, almost invariably arises from the quality of the alcohol; that which is generally employed is the ordinary rectified spirit of commerce, about 56 O.P., and containing a large percentage of water; this, on account of the quantity of water it contains, can be used but sparingly, in about the proportion of two parts to six of æther; if more be employed, we almost invariably have reticulation, whereas alcohol of a high specific gravity can be used to almost any extent without producing this effect. Besides, the necessity of absolute alcohol being used will be more apparent when we bear in mind that the sensitiveness of collodion is dependent to a considerable extent upon the proportions in which these are employed; the larger the quantity of alcohol the more sensitive the film, and *vice versa.* Those, however, who employ iodide of potassium for iodizing collodion, here meet with a difficulty, for absolute alcohol is a bad solvent for this salt, and they fail to get a sufficiency of it dissolved in the quantity of alcohol that they usually employ. I should advise them therefore to increase the quantity of spirit, and they will, I think, in every respect, improve their collodion. I may here mention that the mode by which I procure alcohol of a high specific gravity is to mix dry pearl ashes with ordinary spirits of wine, shake it frequently during several hours, and then distil. Æther may be rectified in the same manner, but a good sample of ordinary washed æther scarcely requires re-distillation. The iodides most generally used for iodizing collodion are those of potassium, ammonium, and cadmium; some operators prefer one, some another, and some a mixture; either of the latter is very soluble, but that of ammonium is found to be very liable to decomposition, the collodion soon assuming a brown tint from lib ation of iodine. Some persons add a sm quantity of ammonia to the iodizing solution, prevent this change taking place; it is, howev a dangerous experiment, for nothing te sooner to ruin a bath than the faintest trace ammonia; after two or three plates coated w such collodion have been dipped in the ba fogginess is the invariable result.

Sensitiveness of collodion is also much fluenced by the quantity of iodide that it c tains. As a rule, I believe that most of positive collodions in use are over iodized, fo is invariably found that a moderately transluc film produces more definition and half-tone t one that is creamy, the latter, however, generally preferred by those who are not v experienced photographers, inasmuch as i less sensitive, and therefore more manageal a proficient in the art will, I think, prefe *semi-transparent* film and a neutral bath.

BATH.

No less important than the collodion is preparation and preservation of the nitrate b Its qualities are:—that it should be transpa t and colourless, free from alkali and nitric a and incapable of dissolving iodide of sil Now a solution of nitrate of silver in p water, is not affected by light, even by expo to the brightest sunshine. If organic ma however, is present, light has the effect of ducing the silver, which falls to the botton the form of a black insoluble powder; s shows the necessity of preserving a bath t is in use, and which in consequence beco s considerably impregnated with organic ma r derived from æther, &c., in some place shelt d from the light. The bath for positive pict s should be made from nitrate of silver in crys; these, before solution, should be thorou y dried with considerable heat, though not i- cient to fuse them. Nitrate of silver is y liable to be contaminated with nitric acid, g frequently crystallised from an acid solu n, we, therefore, dry them to expel this acid, w h, as I will afterwards show, has a preju al effect. Iodide of silver is to some extent so le in a solution of nitrate, we must not n- sequently fail to saturate the bath with is compound previously to its being used for n- sitizing the plates, otherwise, if they rema in it a short time longer than is absolutely n s- sary to perfect the film, it begins to eat y, and thus to produce an irregular action he developer.

The presence of any acid in a bath inva bly diminishes the sensitiveness of the plate, as a bath neutral to test paper is liable to h an alkaline reaction on the plate from the pr nce of oxide of silver, and consequently has en- dency to produce foggy pictures, it is a ays advisable to add a minute quantity of tic acid, one drop of glacial acid being suffici for several ounces of bath. Nitric acid must ow- ever, if possible be avoided, as it alway ery powerfully retards photographic action, t gh it often with a collodion yielding a cream film produces very bright pictures.

NEGATIVE BATH.

I have just stated that a positive bath ould

made from dried crystals of nitrate of silver, not from fused. A negative bath, on the trary, should be made from fused nitrate, as in state it is invariably found to produce iter intensity. When it has been kept in a e of fusion for a short time, part of the ate is decomposed, a portion of its oxygen xpelled, and a salt of a lower degree of oxion remains, namely—the nitrite. This salt uch more readily reduced than the nitrate, ng to its being a compound of a weaker , and is, therefore, by prolonged develop- t more capable of yielding greater intensity. positive, you will bear in mind, we want sitiveness, or a facility of receiving imssions with rapidity. In a negative, on the trary, *intensity* or thickness of the deposit of er upon the plate, so as to produce opacity transmitted light, and whenever nitric acid resent in a negative bath feeble pictures will the certain result. Its contaminating innce may to a considerable extent be counacted by the addition of an acetate of any l; by this means we substitute free acetic for nitric.

any persons are accustomed to add alcohol nall quantities to the nitrate bath, with the ntion of increasing the sensitiveness of the e; this it certainly does effect, but at the e time, I think, it is not an advisable addition, I have invariably found that the pictures luced by it have too much intensity in the lights; for instance, in portraiture the face most invariably overdone before the drapery, rk, has had time to make any impression. his principle it is, too, that the best photohers condemn the addition of accelerators ollodion.

DEVELOPMENT.

he next division of my subject, and that ch is least susceptible of a satisfactory exation, is the bringing out to view a latent ge by means of a developer. Silver has, paratively speaking, but a feeble affinity for gen—so slightly so, indeed, that light alone reduce most of its salts, more or less, comely to the metallic state; the light, however, passes through the lens of the camera is of small intensity, that photography could made but little progress unless we posed the means of perfecting that action which feeble light of the camera has already comced upon the sensitized plate. Of what the ary state of that action really consists I t confess my total ignorance. 'Tis true that ries, more or less plausible, have been proaded by gentlemen of a philosophical turn of d, but these theories appear to me but a k for the concealment of ignorance. We w, however, that a remarkable, though an sible, alteration must have been effected in constituents of the film, or the application developer could never have produced the tiful results that are obtained. It seems nge, too, that the iodide of silver, a comnd that of itself is least susceptible of the ence of light, is of all others the most sen- e when aided by the application of a deoper. Development is essentially a process eduction. As I before stated, constituents e oxide and salts of silver are held together by very feeble affinities; and, consequently, slight disturbing causes are sufficient to effect a molecular change in the arrangement of their elements. This change seems to be commenced by a very feeble light, and would be unknown to us but for the application of some chemical agent to render it visible. This agent we term a developer, and those most generally employed are solutions of the salts of protoxide of iron, gallic, or pyrogallic acid; these, having a tendency to absorb oxygen when brought in contact with silver salts, reduce them to the metallic state. The appearance of the precipitate of metallic silver thus obtained varies much in colour, dependent upon the reducing agent employed, and also upon the manner in which it is used. If gallic or pyrogallic acid be employed, it is a black powder, whilst the salts of iron, especially with the addition of nitric acid, produce a sparkling precipitate, like frosted silver. In this case the excess of nitric acid impedes the action, and the particles, being formed more slowly, are large and crystalline, the colour of a metal in mass being no indication of what it will be in fine powder. There are two distinct oxides of iron that form salts—the first consisting of one atom of O in combination with one of iron, the second consisting of two O to three iron. Now, the first of these is a very unstable compound, in consequence of its tending to pass into a higher degree of oxidation, and on this depends its utility as a developing agent; for, when brought in contact with oxide of silver or its salts, it appropriates to itself the oxygen, and precipitates the silver in a metallic state; and this is the cause, too, of a solution of photo-sulphate of iron so speedily becoming discoloured when exposed to the air.

Gallic acid, as you are aware, is procured from nut galls. It is but a feeble acid, and forms salts with the alkalies and earths, but not with the noble metals (so called from their possessing a slight affinity for oxygen, and consequently preserving their lustre unimpared when exposed to air, moisture, and other influences); these it precipitates in the metallic state.

Pyrogallic acid, prepared by heat from gallic acid, is not an acid, except in name, forming no salt nor affecting litmus paper. It possesses, however, a reducing power much greater than either the proto-salts of iron or gallic acid. So powerful is this, that it requires the addition of some other acid to retard and modify its effects; hence we usually employ acetic acid in our developing. We find that the action of a developer depends upon the reduction of *oxide* of silver to a metallic state. What we have to deal with, however, in the collodion film is *iodide* of silver, and on iodide of silver these reducing agents have no effect; for the pure iodide may be exposed to sunshine in presence of pyrogallic acid without being discoloured. How, then, in this case, does a developer act where there is no oxygen to be absorbed? Two theories have been proposed to explain the matter. By the first it is supposed that an atom of water plays an important part in the process, by furnishing O. to the developer and H. to the iodine, which latter forms free hydriodic acid, whilst the

silver is precipitated, $Ag\,I + HO + Pyro = Pyro + O + HI$. This, however, is not entirely satisfactory; for, as I have just stated, pure iodide of silver, exposed to light in the presence of pyrogallic acid is not blackened. A more satisfactory theory is that which supposes the metallic deposit to be entirely derived from the free nitrate of silver present on the plate, or added to the developer, and that this salt alone is reduced and deposited only on those parts of the plate where the light has effected some mysterious molecular change. I fear that I have scarcely succeeded in expressing myself intelligibly on this part of my subject. It is, I believe, acknowledged to be the most difficult part of photography. As our knowledge of the properties of light, and of those agents which we employ, is increased, we may hope, I trust, to arrive at a more satisfactory explanation of every department of photography. In the choice of a developer for positive pictures much depends upon the taste of the operator; for while some prefer a bright metallic picture, striking contrasts of black and white, others, and I think more artistically, prefer that of a more subdued tone. The bright pictures are always produced by the employment of the protosulphate of iron in combination with nitric acid, the warmer tones by adding to this nitrate of potash, or by using nitrate of protoxide of iron, or pyrogallic acid with nitric acid; and where so much depends upon the taste of the operator it will be impossible to give a formula that will be generally acceptible. That which I prefer, and have used with some success, is a modification of one that appeared some months ago in the *Liverpool Photographic Journal*, consisting of protosulphate of iron, nitrate of potash, acetic and nitric acid. I employ

15 grains of protosulphate,
3 grains of nitrate of potash,
5 drops of acetic acid, (glacial),
2 drops of nitric acid,
1 ounce of water.

I now approach the end of what, I fear, has been but a tedious essay. The last part of the process, namely, the fixing of the picture, is effected simply by the removal of such portions of the iodide of silver as have been unaffected by light, or the deposit of metallic silver. This is accomplished by the application of some chemical capable of dissolving it. The agents usually employed for the purpose are hyposulphite of soda and cyanide of potassium, preference being generally given to the latter salt. The effect, however, in this case is not a simple solution, but a chemical change; for the iodide is decomposed, converted into cyanide of silver, and this is soluble in cyanide of potassium, forming a double salt. It only remains for me now to state that this subject will be open for discussion; and I shall be glad to hear the remarks of any members upon it, and to reply to such questions as I may have the ability to answer.

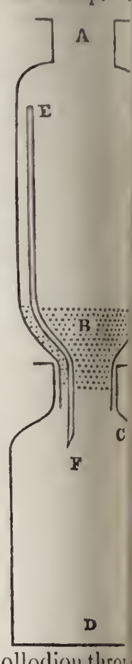
Votes of thanks were passed to Mr. HEPWORTH for his paper, and to Mr. NICHOLSON for his conduct in the chair.

The next meeting will be held on the second Thursday in August.

COLLODION FILTER.

By JOHN SANG, Esq.*

"AB is a glass bottle holding about six eight ounces: the upper end A has a lip, and neck is fitted for an ordinary cork; the un end B has no lip, and the neck is well ground fit into the neck of the smaller bottle CD, a to be air-tight; the under bottle has a lip. is a narrow glass tube bent at B, so that when placed in the bottle AB, it does not fall through it. The end F of the tube is sloped away to a point. A little fine clean cotton is wraped loosely round the tube at the bent place, and a small quantity is also packed round it at the neck and part of the under end of the bottle at B. The collodion to be filtered is poured in at A, taking care not to allow any of it to get into the glass tube, and the bottle is corked up. The collodion filters slowly through the cotton, and drops from the end of the glass tube F, which, on account of being tapered away, is always open to allow of a communication for the air between E and F. It is well to pour back the first portion filtered, as the cotton generally contains a little dust.



"If it be wished to filter the collodion thro common filtering paper instead of cotton, paper should be folded into eight instead of parts. It is then to be pushed through the A. By blowing into the bottle, the filter wil expanded, and one of the folds will receive glass tube which has been previously put its place; the collodion is then to be pou into the filter and the bottle corked up.

"The filter being air-tight, there is no from evaporation; the collodion does not ha on the surface of the paper; and there bei free communication for the air between the faces of the under and upper fluids, the filtra takes place, in fact, as easily as it does for liquids.

"It may not be amiss to show how any may extemporize a filter of this sort. In between the time of sending away the dra to the glass-house and getting back the a ratus, I made one from common phials, w answered the purpose as well in every res as the more expensive one.

"It is necessary to select two phials, the of the upper one of which with its lip also pass into the neck of the under one; the phial, however, should be a moulded one— is, having no punty mark. On applying the or corner of the bottom of such phial for minutes to a grindstone, the bottom will fa and leave a hole (on account of the metho which moulded bottles are made), not only round, but also tapering downwards, so th may be rendered perfectly air-tight by a cork. In order to make the junction at B impervious to the evaporating ether, it is

* Read before the Photographic Society of Scotland

ssary to wrap some cotton, moistened by arabic, round the outside of the neck of the r bottle, and bind it well with a thread. lip (which is allowed to remain) acts as a of flange, and allows a very neat work to be with the cotton and thread. The glass is easily bent to the required form by holding in the flame of a candle; a bit of a tobacco previously saturated with gum arabic and l, will even answer its purpose at a pinch."

LYCYRRHIZINE IN THE NEGATIVE EXCITING BATH.

By T. F. Hardwich, Esq.

E employment of glycyrrhizine in negative dion, with the view of increasing the inten- of the image, has the disadvantage of lessen- the sensitiveness and keeping qualities of fluid. To obviate this, it is proposed in in cases to add the material to the nitrate by which a similar effect, although of a lecided character, is produced.

The following experiment was made in order certain how far an organic body, dissolved lution of nitrate of silver, could be expected fect the properties of iodide of silver pre- ited from that solution. An ordinary collo- nitrate bath, newly made and saturated iodide of silver, was divided into two equal ons, to one of which glycyrrhizine was l in minute quantity; then, after a careful tion, both portions were diluted largely distilled water, until the iodide of silver separated in a finely divided state. In ty-four hours the milky deposit subsided, vas carefully washed to remove the nitrate ver. The two portions of iodide were then cted, exposed to the light and compared. differed evidently in appearance, the iodide the pure solution of nitrate of silver being slightly darkened, but that precipitated the solution containing glycyrrhizine ig acquired a characteristic red tone.

This experiment, taken in connexion with the nentioned in my last paper—that an iodized remains nearly or quite clear in a bath of te of silver, if a sufficient excess of glycyr- ne be previously added to the collodion— s to show that an affinity exists between organic body and iodide of silver. In the experiments made with glycyrrhizine this not understood, and consequently the npts to use it in the nitrate-bath were un- ssful; however carefully the plates had coated, they invariably exhibited, after opment, transparent lines in the black of the negative, crossing each other at ite angles. On shaking up the bath with divided iodide of silver and filtering it, markings disappeared, and since the plan turating the bath with iodide *after the addi- f the glycyrrhizine* has been adopted, they not recurred.

The amount of glycyrrhizine which will dis- in a solution of nitrate of silver of the gth used in photography, is not greater the $\frac{1}{30}$th of a grain to the ounce of liquid, of this minute quantity the greater part ates on exposure to sunlight, forming a lent reddish precipitate as before stated. Little or no separation of the organic matter, however, appears to take place as long as the bath is kept in the dark.

"The photographic effect of the resin-sugar in the bath is not so decided as that produced by adding it to the collodion, but the former mode has the advantage in not interfering with the sensitiveness or the development of the middle tints. A change of colour is the principal difference seen. The image loses the violet-blue tone which it usually possesses when formed on a pure collodion, acquiring in its place a shade of red or brown, which is more intense and far better for printing. Very soft and pleasing proofs are obtained in this way, although the negatives appear translucent on being held against the light. The process being very sensitive is well fitted for photographing animals, and for taking views nearly instantaneously. Negatives of the river Thames, with the shipping quite distinct and the smoke seen curling from the funnels of the steam-boats, have been obtained with a stereoscopic view-lens of $\frac{1}{4}$-inch diaphragm by an exposure of one second for each picture.

"In pursuing the subject, we describe the mode of preparing the bath with the glycyrrhizine, and afterwards add some remarks on the difficulties which may probably occur in carrying out the process.

"*Preparation of the Nitrate Bath.*—Take of

Fused nitrate of silver	600 grains.
Iodide of cadmium......	3 grains.
Alcoholic solution of glycyrrhizine*	1 fluid drachm.
Alcohol	3 fluid drachms.
Glacial acetic acid..............	10 minims.
Water	20 fluid ounces.

"Dissolve the nitrate of silver in three ounces of the water, the iodide of cadmium in half an ounce: mix and stir until the precipitate redissolves. Dilute with water to 10 ounces; add the other ingredients in the formula, make up the bulk to 20 ounces, and filter.

"In introducing glycyrrhizine into a bath already made, proceed as follows:—drop the required quantity of the alcholic solution into the bath, then dissolve a drachm of nitrate of silver in three drachms of water, and one or two grains of iodide of cadmium in one drachm of water: mix, stir until clear, add to the bath, and filter. In this way the solution will be saturated with iodide of silver, and the peculiar markings before referred to will not be seen.

"*Remarks.*—The glycyrrhizine has been used in three different proportions, viz., one minim, two minims, and three minims to the ounce of nitrate solution. The first appeared to be sufficient for portraits, but not for views, the two latter giving the greatest intensity.

"The quantitity of acetic acid advised in the formula is greater than usual. In very hot weather, the thermometer standing at 90°, it was found difficult to preserve the transparent parts of the negative clear, and since the glycyrrhizine appears to add somewhat to the sensitiveness, the retarding effect of the acid in the bath is less seen.

"As the condition of the collodion and also of

* This solution contains five grains of pure glycyrrhizine dissolved in one ounce of alcohol.

the developer affects, to a great extent, the action of the bath, it may be well to mention the following particulars. The collodion, if colourless and iodized with iodide of cadmium, must be alkaline to test-paper. The film should be tolerably creamy: a pale blue film did not appear to give any perceptible increase of intensity when dipped in the bath containing the organic matter. Collodion iodized with iodide of potassium or ammonium, will succeed with a nitrate bath containing glycyrrhizine; but supposing both preparations to be newly mixed, the cadmium salt will usually give the greatest intensity in the high lights.

"The state of the developing solution is a point of importance. The smaller the quantity of the acetic acid the greater the intensity, as a rule. Ten to fifteen minims of the ordinary glacial acid will be sufficient, with a little alcohol, if necssary, to make the solution flow. I have traced failures more than once to the state of the developing solution: the pyrogallic acid or the acetic acid being in fault, and the reducing power of the liquid too small to give a dense brown negative.

"The tendency to stains and markings on the film is probably increased by the presence of glycyrrhizine in the bath. The whole process is, in fact, so sensitive, that it requires unusual care in working. If the plates are not moved up and down whilst in the bath, there will be vertical lines in the direction of the dip; and unless proper care be exercised in draining, and wiping the back of the glass, marks like curtains will be seen at the most depending part of the film. These stains can be produced almost at pleasure, by tilting the plate before applying the developer. A wave of nitrate then flows back, and causes marks which are more transparent than the other portions of the image. Also particles of dust in the collodion, or from the slide, which might perhaps escape notice in using a newly mixed and slightly acid bath, will be likely to produce a spot when the bath contains organic matter, a central nucleus being seen, surrounded by a ring of reduced silver. The same thing often happens when the bath contains much acetate of silver, or when, by continued use of old collodion, organic products of decomposition have accumulated in it. Insoluble particles floating in the developing solution are also a source of spots: they should be removed by filtering through blotting-paper.

"I have tried the effect of glycyrrhizine in the exciting bath in the oxymel preservative process, and also the waxed-paper process. In both cases the development was rapid, and the skies intense. After four days' keeping, however, the thermometer standing at 75° to 85° Fahr., the oxymel plates prepared in this way solarized very strongly, the skies being steel-blue by reflected light and pale red by transmitted light.

"With certain kinds of collodion, already sufficiently intense, the presence of a body like glycyrrhizine in the bath is a disadvantage, and especially so in portraiture. The image comes out of a ruby-red tint, and the negative will not print properly. This state of things may be remedied to a great extent by shading off the light as much as possible, and using a weak de-veloper, with a large proportion of acetic ac[id]; but the best plan will be to employ two ba[ths], one prepared with and the other without glyc[yr]rhizine. When the collodion is newly mi[xed] and feeble, dip the plate in the former; bu[t if] by keeping, or by an organic addition, it [has] acquired greater intensity, the latter will g[ive] the most perfect picture.

"In concluding these papers on glycyr[rhi]zine, it must be confessed that absolute uni[for]mity in the colour and mode of developmen[t of] the collodion image cannot be obtained in [the] present state of our knowledge. There [are] atmospheric conditions, imperfectly underst[ood], which affect the result. In the late su[mmer] weather I have found it sometimes diffi[cult], even with the aid of glycyrrhizine in the b[ath], to obtain a dense negative, and have been c[om]pelled either to push the development [ver]y much with nitrate of silver, or to add [an] organic substance to the collodion in such [pro]portion as, on a favourable day in the e[arl]y spring months, would have produced exce[ssiv]e intensity and loss of half tone."—*Jour. Photo.* [S.]

PHYSICS OF PHOTOGRAPHY.

ABSORPTION OF LIGHT.—No body is perf[ectl]y transparent; some light is evidently lo[st i]n passing even through space, and still mo[re i]n traversing our atmosphere.

Amongst the most curious instances o[f ab]sorption is that which is uniformly discov[ere]d in the solar spectrum, if we examine it w[ith] a telescope. We then find that the coloured [ray]s are crossed by a great number of dark ban[ds o]r lines, giving no light of any colour; thes[e a]re generally called Fraunhofer's dark lines, [as] it was to the indefatigable exertions of that [ex]perimentalist, and by the aid of his beautif[ul i]nstruments, that most of them were discov[ere]d, and measured, and enumerated. It is [qui]te clear that those lines represent rays which [ha]ve been absorbed in their passage from the s[un] to the earth; although some of them hav[e, no] doubt, undergone absorption within the [lim]its of the earth's atmosphere. We have [eve]ry reason to believe, with Sir John Herschel [th]at the principal absorption takes place i[n t]he atmosphere of the sun; and it has been s[ho]wn by Dr. Miller that the number of lines i[s c]ontinually varying with the alteration of a[tm]ospheric conditions.

It has been calculated by Bouguer that [o]ur atmosphere in its purest state could be ext[end]ed rather more than 700 miles from the [ear]th's surface, instead of nearly 40, as it is at p[res]ent, the sun's rays could not penetrate it, a[nd] this globe would roll on in darkness and [sil]ence, without a vestige of vegetable form or of [ani]mal life. The same calculation supposes th[at] sea water loses all its transparancy at the d[ept]h of 730 feet, but a dim twilight must prevai[l m]uch deeper in the ocean. The researches of [Pro]fessor Edward Forbes have proved that [at] the depth of 230 fathoms in the Ægean sea, t[he] few shelled animals that exist are colourle[ss;] no plants are found within that zone; and th[e] distinguished naturalist fixes the zero of [an]imal life at probably about 300 fathoms.—*The [P]oetry of Science, by Robert Hunt, F.R.S.*

AMATEURS' COLUMN.

APER FOR PHOTOGRAPHY.—We have followed the linen pieces until they have been reduced to a mass of pulp, or *stuff*, as it is called by the workmen. We have seen that this stuff be of long or short fibre, according to the time during which the beating operation is carried on, and we now want to know the ness or length of fibre best adapted for the requirements of photography. It must be at once acknowledged that we cannot with complete satisfaction reply to this question. It ossible that the answer may depend upon ultimate use of the paper we are experimentally manufacturing. For *positive* printing a *h* paper with a smooth surface is all we uire, so far as the mechanical conditions of mass are concerned; but for the *negative* ch is to be copied from, by light transmitted ugh its texture, perfect uniformity, intery as well as externally, is to be wished for. ighness is here also desirable, in order that paper may bear without injury the repeated tings, soakings, rinsings, and handling to ch it is submitted by the photographer. , unfortunately, great toughness and perfect ormity of texture are incompatible qualities, we must to some extent sacrifice the one to other. With stuff of *long fibre* we get the ghest kind of paper, the interweaving or *ng* action (if it be one) can obviously be ied to a greater length, besides which the es are less disintegrated than in the short stuff. But the tough paper, when examined by transmitted light, presents a mottled earance, as though (which is the fact) the or stuff had gathered itself up into lumps ng the moulding process presently to be ribed. This mottling is sometimes evident igh to disfigure completely the finished ures, and it must be at all times objecable. Apart from this defect the long fibre er gives a good result, indeed many of the negatives taken by Mr. Talbot and Mr. neman, in the early days of paper photophy, were made upon a paper which was inguished from others by this very defect. oes not follow that a mottled texture is a to be relied upon, for equally good negatives e been made on a thick paper devoid of this acteristic appearance and made of short stuff. This latter paper was, however, *y tender* when whet, and liable to tear even i very careful handling. From these conrations it will be seen that difficulties of ipulation oppose us as we approach perion in the physical structure of the essential s of our paper photography. Our fibre was in a rather long condition, and gave mately a very tough fabric, indeed so tough it was described by the workman as being *e bladder*" when wetted. It seems probable with new linen fibre a shorter condition of stuff than usual may be permitted. Thus have, as far as we can, answered the stion of long or short fibre propounded in last number. We shall next examine the aratus and manipulation necessary to form pulp into a sheet of unsized hand-made er.

M.

HISTORY OF PHOTOGRAPHY.

THE CALOTYPE OR TALBOTYPE.

"It may be proper," observes Mr. Talbot, in the introduction to his "Pencil of Nature," "to preface these specimens of a new art by a brief account of the circumstances which preceded and led to the discovery of it. And these were nearly as follows:—

"One of the first days of the month of October, 1833, I was amusing myself on the lovely shores of the Lake of Como, in Italy, taking sketches with Wollaston's camera lucida, or rather, I should say, attempting to take them; but with the smallest possible amount of success. For when the eye was removed from the prism—in which all looked beautiful—I found that the faithless pencil had only left traces on the paper melancholy to behold.

"After various fruitless attempts I laid aside the instrument, and came to the conclusion that its use required a previous knowledge of drawing, which unfortunately I did not possess.

"I then thought of trying again a method which I had tried many years before. This method was to take a camera obscura and to throw the image of the objects on a piece of transparent tracing paper laid on a pane of glass in the focus of the instrument. On this paper the objects are distinctly seen, and can be traced on it with a pencil with some degree of accuracy, though not without much time and trouble.

"I had tried this simple method during former visits to Italy, in 1823 and 1824, but found it in practice somewhat difficult to manage, because the pressure of the hand and pencil upon the paper tends to shake and displace the instrument (insecurely fixed, in all probability, while taking a hasty sketch by a roadside or out of an inn window); and if the instrument is once deranged, it is most difficult to get it back again so as to point truly in its former direction.

"Besides which, there is another objection, namely, that it baffles the skill and patience of the amateur to trace all the minute details visible on the paper; so that, in fact, he carries away with him little beyond a mere souvenir of the scene—which, however, certainly has its value when looked back to in long after years.

"Such, then, was the method which I proposed to try again, and to endeavour as before to trace with my pencil the outlines of the scenery depicted on the paper; and this led me to reflect on the inimitable beauty of the pictures of nature's painting which the glass lens of the camera throws upon the paper in its focus—fairy pictures, creations of a moment, and destined as rapidly to fade away.

"It was during these thoughts that the idea occurred to me. . . . . . How charming it would be if it were possible to cause these natural images to imprint themselves durably, and remain fixed upon the paper!

"And why should it not be possible? I asked myself.

"The picture, divested of the ideas which accompany it, and considered only in its ultimate nature, is but a succession or variety of stronger lights thrown upon one part of the paper, and of deeper shadows on another. Now light where it exists, can exert an action, and

in certain circumstances does exert one sufficient to cause changes in material bodies. Suppose, then, such an action could be exerted on the paper; and suppose the paper could be visibly changed by it. In that case, surely some effect must result having a general resemblance to the cause which produced it; so that the variegated scene of light and shade might leave its image or impression behind, stronger or weaker on different parts of the paper according to the strength or weakness of the light which had acted there.

"Such was the idea that came into my mind. Whether it had ever occurred to me before amid floating philosophic visions, I know not, though I rather think it must have done so, because on this occasion it struck me so forcibly. I was then a wanderer in classic Italy, and of course unable to commence an inquiry of so much difficulty; but least the thought should again escape me between that time and my return to England, I made a careful note of it in writing, and also of such experiments as I thought would be most likely to realise it, if it were possible.

"And since, according to chemical writers, the nitrate of silver is a substance peculiarly sensitive to the action of light, I resolved to make a trial of it, in the first instance, whenever occasion permitted on my return to England.

"But although I knew the fact from chemical books, that nitrate of silver was changed or decomposed by light, still I had never seen the experiment tried, and therefore I had no idea whether the action was a rapid or a slow one; a point, however, of the utmost importance, since if it were a slow one, my theory might prove but a philosophic dream.

"Such were, as nearly as I can now remember, the reflections which led me to the invention of this theory, and which first impelled me to explore a path so deeply hidden among nature's secrets. And the numerous researches which were afterwards made—whatever success may be thought to have attended them—cannot, I think, admit of a comparison with the value of the first and original idea.

"In January, 1834, I returned to England from my continental tour, and soon afterwards I determined to put my theories and speculations to the test of experiment, and see whether they had any real foundation.

"Accordingly, I began by procuring a solution of nitrate of silver, and with a brush spread some of it upon a sheet of paper, which was afterwards dried. When this paper was exposed to the sunshine, I was disappointed to find that the effect was very slowly produced in comparison with what I had anticipated.

"I then tried the chloride of silver, freshly precipitated, and spread upon paper while moist. This was found no better than the other, turning slowly to a darkish violet colour when exposed to the sun.

"Instead of taking the chloride already formed and spreading it upon paper, I then proceeded in the following way. The paper was first washed with a strong solution of salt, and when this was dry, it was washed again with nitrate of silver. Of course, chloride of silver was thus formed in the paper, but the result of this experiment was almost the same as before, the chloride not being apparently rendered more sen[...] tive by being formed in this way.

"Similar experiments were repeated at vari[...] times, in hopes of a better result, frequen[...] changing the proportions employed, and so[...] times using the nitrate of silver before the s[...] &c., &c.

"In the course of these experiments, wh[...] were often rapidly performed, it sometimes h[...] pened that the brush did not pass over t[...] whole of the paper, and of course this produc[...] irregularity in the results. On some occasio[...] certain portions of the paper were observed [...] blacken in the sunshine much more rapidly t[...] the rest. These more sensitive portions w[...] generally situated near the edges or confines [...] the part that had been washed over with t[...] brush.

"After much consideration as to the caus[...] this appearance, I conjectured that these b[...] dering portions might have absorbed a les[...] quantity of salt, and that, for some reason [...] other, this had made them more sensitive to t[...] light. This idea was easily put to the test [...] experiment. A sheet of paper was moiste[...] with a much weaker solution of salt than usu[...] and when dry, it was washed with nitrate [...] silver. This paper, when exposed to the su[...] shine, immediately manifested a far grea[...] degree of sensitiveness than I had witness[...] before, the whole of its surface turning bl[...] uniformly and rapidly; establishing at once, [...] yond all question, the important fact, t[...] a lesser quantity of salt produced a grea[...] effect: and as this circumstance was unexpect[...] it afforded a simple explanation of the ca[...] why previous inquiries had missed this import[...] result in their experiments on chloride of silv[...] namely, because they had always operated w[...] wrong proportions of salt and silver, us[...] plenty of salt in order to produce a perfect ch[...] ride, whereas what was required (it was n[...] manifest) was to have a deficiency of salt [...] order to produce an imperfect chloride, or (p[...] haps it should be called) a *sub-chloride* of silv[...]

"So far was a free use or abundance of s[...] from promoting the action of light on the pa[...] that, on the contrary, it greatly weakened [...] almost destroyed it; so much so, that a bat[...] salt water was used subsequently as a fix[...] process to prevent the further action of li[...] upon sensitive paper."

(*To be continued.*)

The Chemistry of Light in 1817.—[...] Thos. Thomson, in the first of the four volu[...] of his "System of Chemistry," distinguishes [...] 14th sectional paragraph of the first chapte[...] the following marginal title: "Light prod[...] changes on bodies;" and goes on to say tha[...] absorption of light by bodies produces [...] sensible changes in them. Plants, for insta[...] may be made to vegetate tolerably well in [...] dark; but in that case their colour is alw[...] white, they have scarcely any taste, and [...] tain but a very small proportion of combus[...] matter. In a very short time, however, [...] their exposure to light, their colour bec[...] green, their taste is rendered much more int[...] and the quantity of combustible matter is [...] siderably increased. These changes are [...]

ous, and they depend incontestibly upon the ıcy of light. Another very remarkable ince of the agency of light is the reduction of metallic oxides. The red oxide of mercury of lead become much lighter when exposed ıe sun; and the white salts of silver, in the e situation, soon become black, and the oxide duced. The oxide of gold may be reduced ıe same manner. Light, then, has the proy of separating oxygen from several of the es. Scheele, who first attended accurately ıese facts, observed also, that the violet ray ced the oxide of silver sooner than any of other rays; and Senebier has ascertained the same ray has the greatest effect in proıg the green colour of plants. Berthollet rved, that during the reduction of the oxides, ıantity of oxygen gas makes its escape.* ıs supposed till lately that those reductions etallic oxides were produced by the colorific of light, but Messrs. Wollaston, Ritter, and mann have ascertained that chloride of r is blackened most rapidly when it is placed nd the violet ray and entirely out of the ıatic spectrum. These observations have confirmed by M. Berard. He found that the ıical intensity was greatest at the violet end ıe spectrum, and that it extended a little nd that extremity. When he left sub:es exposed for a certain time to the action ch ray, he observed sensible effects, though an intensity continually decreasing in the :o and blue rays. Hence it is very probable if he had been in possession of more sensible :ives† he would have observed analogous ts, but still more feeble, in the other rays. oncentrated, by means of a lens, all that of the spectrum which extends from the ı to the extreme violet; and likewise, by ıs of another lens, all that portion which ıds from the green to the extremity of the The last pencil formed a white point so ant that the eye was scarcely able to enit; yet the chloride of silver remained exl to it two hours without undergoing any ble al eration. But, when exposed to the pencil, which was much less bright and less it was blackened in less than six minutes.§

:TS AND SCIENCES ALLIED TO PHOTO'HY.—OPTICAL PHENOMENA.—"It remains s," says Sir John Leslie, in his *Meteorological ys*, "to explain the general optical appears of the sky. When the rays of the sun e upon a cloud, they are copiously reflected, partly absorbed by the minute suspended ıles. In working their progress through ıass of vapour they suffer a great diminufrom the multiplied acts of absorption. quantity of light thus finally detained nds on the density of the cloud, and its :ness; but the portion which penetrates ıgh the nebulous medium is always much less than what traverses an equal body of air. In extreme cases, perhaps, the solar beams will suffer greater defalcation by repeated repercussions within a congregated cloud than from passing through fifty times the same extent of a clear aerial expanse. Hence such clouds always appear dark and black by their scanty transmitted light. Whiteness being produced by the copious emission of intermingled rays, can belong only to very thin clouds. The depth of shade indicates the mass of floating vapour."

* ur. de Phys., xxix. 81. When muriate of silver is exposed solar light it blackens almost instantaneously. In that is not oxygen gas which is emitted, but muriatic acid, as een observed also by Berthollet. See Jour. de Phys., i.

† e employed chloride of silver, which becomes black; :, which passes from yellow to green, as Dr. Wollaston served; and a mixture of chlorine and hydrogen, which ıte when exposed to light, as Dalton, and Gay-Lussac, and ırd ascertained

§ ınals of Photography, ii., 165.

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—Perhaps you could inform me through the next number of the *Journal* of a suitable stand, or something of the kind, for copying photographic portraits, prints, engravings, &c., or applicable for all sizes, from the small $\frac{1}{9}$ to large engravings, and so that they could be easily placed on and taken off, and arranged at any angle at pleasure; also please give me full and clear directions for making some sort of covering, or small tent, for keeping out diffused light from the camera whilst working the collodion process in an open garden. You could also, perhaps, inform me how the Americans mount their mat, glass, and picture, as they do not use any preserver, and their pictures always appear very free from dust, &c.

July 21, 1857. PHILO PHOTO.

[1. M. Claudet uses a large board, well framed together, and hinged to a stout block of wood attached to a vertical sliding pillar which can be fixed at various heights by a screw passing through its exterior sheathing. The board can thus be raised or lowered, and placed vertical or horizontal, to fasten on the print by drawing pins. If the stand has only three legs the back one can be raised by a wedge, which will throw the board, now supposed to be vertical, into a position inclining forwards. In this latter case the whole arrangement must, of course, be held up by a strong cord, or better, by any non-elastic support, unless the gravity of the whole is sufficient to allow the inclination of the board and print. To incline the board backwards at a given angle, an iron quadrant arrangement and screw is employed. It is quite a piece of workmanship. 2. Make a hollow truncated pyramid of mill-board, and line it with black velvet; then place the *base* of the pyramid against the front of the camera and arrange so that the lens shall be seen from every part of the background you wish to include. This as a rule will answer your purpose, but there are cases where nothing short of a tent, or an immense perforated screen will suffice. 3. We cannot at present answer your last question.—Ed. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

R. S. D. has our best thanks. He is too late for this number.

A BEGINNER.—We prefer a north or a north-east light. It is true you can modify the sunlight by curtains, but practice tells us that the effect is not so good; a flatter picture is obtained, or the exposure is required to be longer. It is not necessary to expend much money upon a glass house. In France, at Rouen, we were attracted to a street-frame of pictures by their unusual merit, and on enquiry we found that nearly three-fourths of the *glass* room in which they were taken consisted of *rough boards*. The light was kept high, and was to the north-east. We shall describe this room.

PHILO PHOTO.—Since replying to your note we have had a visit from an American gentleman, and we shall shortly be able to examine the mounting of some fine positives on glass he brings with him.

Steel Pen has seen an American locket constructed so as to appear similar to a hunting watch when closed, but upon touching a spring the front and back of the case falls open and exhibits four portraits, one on each half of the case, and one on each side of the centre piece, or that portion which in a hunting watch contains the works. Could any of our readers inform him whether such articles can be procured in England, and if so, where?

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 16.—AUGUST 15, 1857.

eaders will peruse with satisfaction an it of the only true dry collodion process vented, which will be found under our of the Manchester Photographic Society's l meeting. Mr. Sidebotham deserves the st thanks of all photographers for the d liberality he has shown in this matter. ly a successful manipulator in the older ocesses, he is perfectly competent to form ment of the relative merits of the various ds hitherto at our disposal, and he does sitate to say that the plan which he now uces is more simple and more certain than f the collodio-albumen process. After ing a plate in the usual manner with a ilm collodion, the nitrate of silver is to noved by a stream of running water, first care to dip the plate into a dish of water o equalise the washing action. The plate 1 to be thoroughly drained and set up to and now comes the novelty upon which s seems to depend. The dry plate has inally heated up to a temperature of 150° ° Fahrenheit: when cool, it is put away for use. As Mr. Sidebotham gives full s, any further remarks of ours will at it be superfluous. We would just observe his final success of a method which had supposed to be next to useless, may serve ck those who decry what they are pleased il—the mere multiplication of formulæ. ss so often depends upon minute points, ve cannot at this early stage of the art in reason, too many accounts of the pro- igs of successful operators. It is probably y a long and minute comparison of many that we shall be able to arrive at a know- of the principles which govern the pro- n of the most approved results.

had not time to allude, in our last number, paper by Mr. Hepworth, on the "Chemistry Collodion Process." It may be read with itage in connexion with the papers by Mr. w, the first of which we to-day give in o. We are not yet satisfied that the stry of collodion has been exhausted, for et the most contradictory and otherwise exing accounts from different persons who espectively the various collodions and opers now extant. How much of this tainty depends upon want of skill or attentive observation in the operator it is difficult to say. This much is certain, that the practice of working with empirical materials must render it more difficult to arrive at a conclusion respecting the discrepancies observed. Hence our advocacy of the home manufacture of collodion. How amusing it is to find those who keep secret their processes alleging that they are anxious to save the amateur trouble and disappointment. Surely the said amateurs are the best judges of the value of their time and means. We think it more than probable that it is the profit derived from the manufacture, and not the consumer's waste of time or money, that such hypocritical empirics care about; and if they would only honestly say so, we might view their proceedings with more patience. We shall certainly do our best to unravel the mysteries of these secret-mongers. We hold that an honestly described patent would do more to advance the science of photography than all the labours of those who, while decrying patents, lock up in their selfishness the little knowledge that accident more than genius has thrown into their hands. There are, happily, many amongst the makers and vendors of photographic materials to whom our remarks are totally inapplicable, and we trust their number may be rapidly increased. In the long run, a readiness to impart information will prove to be the best policy. And now, in conclusion, should any of our readers express surprise at the freedom of our remarks, we beg beforehand to assure them that we have at hand very special reasons for our justification, which could only be made more evident by personal allusions. We simply wish to evoke a new feeling respecting such matters, and this without waging personal warfare.

Some of Mr. Frith's, or Messrs. Frith and Wenham's views of Egypt, are remarkably fine. The plates measure 15 by 19 inches, and we have been informed that success is attained only by repeated efforts, assiduously made, until a good negative is secured. This was the practice of M. Flacheron, of Rome, in the early days of photography; and we commend it to Mr. Fenton, whose views of London will not otherwise rival his successful Crimean and Scotch productions.

There is an interesting abstract of M. Claudet's last Royal Society's paper in our impression of to-day. He has kindly revised it, and repeated before us his experiments. They are very striking, and demonstrate clearly the existence of a fact which it is singular should have escaped observation so long, namely, the appearance of relief presented by the ground glass image of the camera obscura.

INVESTIGATION OF PYROGALLIC ACID.

By M. A. Rosing.

M. Anton Rosing has carried out this investigation under the eye of M. Dumas, in the Laboratory of the Faculty of Sciences of Paris. We propose to give those parts of the paper which may most interest our readers.

Perfectly pure pyrogallic acid has no reaction upon litmus paper, but the commercial acid usually has an acid reaction due to the presence of foreign bodies. It cannot be sublimed without alteration; a part becomes decomposed and produces metagallic acid; this has prevented the determination of the density of the vapour. Dry pyrogallic acid undergoes no change under the influence of the air; on the other hand its solution is rather rapidly altered, acquiring a darker colour and finally depositing a brown amorphous substance. This decomposition must not be confounded with that which pyrogallic acid undergoes under the influence of alkalies, for the author has convinced himself that it takes place in air washed by sulphuric acid: it may here be observed that a few drops of hydrochloric acid prevent any coloration of solutions of pyrogallic acid.

Concentrated and dilute hydrochloric acid do not react upon pyrogallic acid either in the cold or at a boiling heat. Pyrogallic acid dissolves in monohydrated sulphuric acid; if the solution be heated it becomes black; with fuming sulphuric acid pyrogallic acid gives a black solution; fuming nitric acid reacts briskly upon pyrogallic acid, and eventually, on evaporation, crystals of oxalic acid are obtained.

Chlorine acts energetically upon pyrogallic acid, and iodine appears to attack it at a high temperature, but the action of bromine is of most interest. When anhydrous bromine is poured upon the crystals, a brisk reaction takes place, with evolution of hydrobromic acid gas; if the excess of bromine be driven off, there remains a heavy yellowish mass, which, when heated upon platinum-foil, takes fire, burns with a flame margined with green, and leaves much carbon. The analysis corresponds with

the formula $C\,12, \genfrac{}{}{0pt}{}{H^3}{Br^3} O^6$

This product is nearly insoluble in cold water, when boiled with water it is partially dissolved and the rest is decomposed: it is soluble in alcohol and ether. The solution is brown, and possesses a very distinct acid reaction; the alcoholic solution when evaporated spontaneously, furnishes magnificent large crystals of a light brown colour, which appear to be oblique rhomboidal prisms; they contain two equivs. of water. Muriatic and sulphuric acids do not appear to act upon this brominated product, but concentrated nitric acid acts upon it strongly, and evolves reddish vapours; with ammonia a solution of the product acquires a very intense red colour, which becomes brown by the action of the air: potash and soda produce an analogous reaction. But the most remarkable effect is produced by protosulphate of iron, under the action of which the brominated substance acquires a very rich blue colour, comparable to Saxony blue or ammo oxide of copper. The sensibility of tl action is such that the substance might r ferrocyanide of potassium for detecting pro of iron. The blue liquid remains for time unaltered in the air, but at leng colour becomes black. In the absence of example in a current of hydrogen, dry niacal gas has no action upon dry pyr acid: the acid remains unaltered.

With an excess of ammonia in contact the air, a solution of pyrogallic acid be of an extremely dark brown colour; sponta evaporation leaves a black amorphous sub of a resinous appearance. This produc sesses the following properties:—It e ammonia when heated with slaked lim also but with difficulty with a solution of p it dissolves in water and alcohol with a colour *so intense and pure* that it might b ployed as sepia. The solution is neut litmus paper, and gives precipitates with many metallic salts, &c., such as acetate o sulphate of copper, chloride of mangane phate of iron, bichromate of potash, and water. The constitution of this substan not been made out.

Numerous experiments on etherificatio pyrogallic acid gave negative results. Co to what has been said, pyrogallic acid d set free carbonic acid from the carbon lime, ammonia, &c., nor from bicarbonate under the influence of the air a solution o gallic acid, mixed with an alkaline carl slowly becomes brown.

Pyrogallic acid reduces, not only the metals from their solutions, but also co the saccharimetric fluid of Frommherz, t which it behaves like glucose; it combin different metallic oxides, forming com the powerful affinity of which for the ox the air renders their preparation very di

It also combines with certain organ stances such as gelatine and caseine.

From the author's experiments, many o may be regarded as preliminary, he ded a general conclusion that *pyrogallic acid true acid;* of all known bodies it most approaches *orcine*. This the author sh formulæ, representing respectively the tion of orcine from orsellic acid, and py acid (or as it might be called pyroga simply *galline*,) from gallic acid.

At the same time pyrogallic acid p some characters analogous to those o pyrogenous acids, especially of pyro acid, and it would not be impossible these bodies in a single group. Pyro acid, pyroracemic acid, comenic acid, conic acid are all pyrogenous acids, the production of which is analogous to pyrogallic acid; they have several pr in common with the latter, and amongst that of striking a red colour with the of iron.

This valuable contribution to the c history of pyrogallic acid will be foun in the *Comptes Rendus* of the French A of Sciences for June 1st. Our abstract from the *Chemical Gazette*, but has been by the aid of the original memoir.

M CHESTER PHOTOGRAPHIC SOCIETY.

SI :IAL meeting of the members of this cic · was held on the evening of Wednes- y, ie 5th instant, at the rooms of the ter y and Philosophical Society, 36, George ree under the presidency of T. H. Nevill, q., or the purpose of receiving a com- uni tion from Mr. Sidebotham, on a new d aluable process in dry collodion, the no cement of which had attracted a large ter ance of members.

Mr SIDEBOTHAM read the following paper On *Dry Collodion Process*":—

So : time ago, I had the honour to read for this Society a paper on the Collodio- our n Process, and I am glad to say many th members have successfully used the m e then given. I have now to lay be- c ou another process, more simple and re ertain; indeed, it appears to me to be o the most valuable additions to practical ot raphy since the invention of the collo- n rocess, and I quite think that it will n upersede all other dry processes on ss The particulars of this process were cr to me some weeks ago by a friend in is and since my return I have found it of h pparent value, that at the request of ie the members I am here this evening to la it, that many of you may make use of n taining some fine negatives during the m r and autumn.

o oubt many of you will smile when the ce is described, it is so nearly like what b n tried over and over again. So long ago th end of 1851 I tried the process, with the e on of one point, and of course failed, a success depended on that point.

h process is as follows:—Prepare a collo- ate in the same manner that you would one n d for the wet process; when the plate is o d from the sensitizing bath, wash it well in t or dish, and afterwards with a stream of e so as to remove all the silver; then n t on blotting paper on all the edges, and e ie back so as to remove all the moisture s n as possible, then rear it up to dry; quite dry, expose it for a few minutes to fi al heat, either in an oven or on a hot te the temperature should be between 150 0 degrees Fahr.; then allow to cool, and ay in a plate box for use. The exposure u d is somewhat the same as in the col- c lbumen process, perhaps rather less is re- , say from two to four minutes—in the ig frame, with good daylight, one to five s is quite enough—in the camera, those ave practised collodio-albumen, will have d iculty in judging of the time. Develope with gallic or pyrogallic acid, and fix yanide.

ll now give a few remarks on the various t of the process:—

silver bath is composed of

itrate of silver	45 grains.
Vater	1 oz.
lacial acetic acid	½ dram.

drying by artificial heat prevents the racking or separating from the glass g the subsequent processes. The mode of development I prefer is as follows:—Prepare—

Pyrogallic acid	1 grain.
Water	1 oz.
Citric acid	¼ gr.

And—

Nitrate of silver	2 grs.
Water	1 oz.

Attach the plate to a holder, and then wet the surface with a stream of water, and drain it well; then pour on and off some of the pyrogallic solution two or three times; after this mix a little of the silver solution with the pyrogallic, and again pour on and off; the image appears rapidly, almost as quickly as in a moist collodion negative. The quality of the collodion appears to be a matter of great importance; it must form what is usually called a powdery or rotten film, a characteristic of old collodion, or that made with gun cotton produced by acids at a high temperature; it should be moderately thick, and rather strongly iodized.

It is to be hoped the makers of collodion will give us a kind specially adapted for this process, and save us the trouble of many experiments. In a collodion with a tough film like Thomas's, the image begins to appear very rapidly, but remains faint; if more silver is added the intensity is increased, but it is only on the surface, and may be rubbed off with the finger, the original faint image being only visible.

I will now show you specimens of the process, and develop a few plates prepared on Saturday, and the images impressed this morning. I may just remark, that for the production of transparent pictures for the stereoscope or magic lantern this process is invaluable; the results are beautiful, and the time in producing them not more than is required for the production of ordinary positives on paper.

Mr. DORRINGTON moved that the warmest thanks of the meeting be presented to Mr. Sidebotham, to whom the Society was so much indebted, both on this and many other occasions.

Mr. PARRY seconded the motion, and

The CHAIRMAN, in putting it, remarked that he thought great credit was due to Mr. Sidebotham, not only for bringing early news of the process to the Society, but for the great success he had had so soon in it. Judging from the specimens on the table, and those which Mr. Sidebotham had developed in the room before them, the process was capable of great things; but, he confessed that success had not attended the attempts of himself and two or three others who had tried it.

The motion was carried by acclamation, and

Mr. SIDEBOTHAM briefly returned thanks, and volunteered to give every explanation in his power which might be required by members as to failures, and assured them that everything known to him on the matter was embodied in the statement he had made.

The pictures developed in the room were prints from collodio-albumen negatives, taken by Mr. Sidebotham in Paris, and some days had elapsed since their preparation.

The CHAIRMAN, before leaving the chair, requested members to remember that a portfolio had been provided, which he hoped would re-

ceive numerous contributions at their hands. He also asked that members, wishing to read papers during the ensuing session, would communicate early with the secretary.

The SECRETARY reminded members that the fund for the widow of the late F. S. Archer was still open, and stated that he had just then received two additional subscriptions. It was announced that the next meeting of the Society would be the annual meeting.

EXHIBITION OF ART TREASURES AT MANCHESTER.

IN our second notice we remarked, respecting the department in which we class the copyists, "that the very matter-of-fact character of copyist class constitutes its chief value." It is not every one that has the taste and knowledge requisite to form a choice collection of paintings, and but to a small minority of those who do possess those essentials, the great cost of works of art places them almost entirely beyond their reach; herein is shown one of the most readily understood attributes of photography: one may have a Royal Academy Exhibition of one's own, a portfolio may contain copies, and those not so costly even as engravings, of the best works both of ancient and modern art.—The workers in the fictile arts would have been delighed to see such copies of their productions as we have in (19) and (33), Luca della Robbia Ware, by C. F. Thompson, and the history of vitreous manufacture might be well told by such pictures as (No. 48), by C. F. Thompson, a crystal cup of great beauty; a gallery of sculpture besides being costly is at the best fragile, and when absolute permanency can be secured for photographs, such pictures as (66) (201) (208) (265), exhibited by the Prince Consort, and (270), exhibited by Dr. Becker, will be invaluable in this department. We have been much gratified in inspecting the numerous copies of paintings in this exhibition; for the most part they are very praiseworthy, and though it might appear to be the most easily practised branch of the art, there is still much scope for the exercise of taste; the actinic effect of different colours is still but little understood, and we still look forward to a day when each tint shall in its photographic effect be distinguishable from others, just as the arrangement of notes in a piece of music, combined with other arbitrary symbols, conveys to us ideas of their value in time, and even of their sound. Mr. Howlett is a large contributor in this branch, and we name as good specimens of his (304) The Vision (Rankly), (302) a Cattle Piece, by Lee and Cooper, (298) Home and the Houseless (Faed), the original of which is in this exhibition (saloon E 117). (451) The Dame's Absence, is a reproduction of a charming picture by A. Rankley, in this year's Royal Academy Exhibition. (448) A Dream of the Future, one might almost suppose to be from the life, it represents a young girl about to seek her fortune in the "Great World of London." (463) Guy Fawkes, T. Brook, is from last year's Royal Academy Exhibition. (461) is an excellent picture, by H. Moore, in the Portland Gallery. (462) The Ship Boy's Letter, Hook. (464) also by Hook, the original painting in the Royal Academy, is marked by almost photographic minuteness, the subject is a look out for nal, "Her Union Jack is at the Fore." G. Smith's Photographer, a picture to whi have before referred. ( ) The Pic-nic, O'Neil, and (453) The Last Day of the Sa the same artist. Mr. Bingham's (446) is a copy of H. Vernet's Battle of the Alma. have numerous copies of engravings, so them hard to be distinguished from the ori with such precision is every stroke of the g reproduced, and so nicely the very colour ink imitated. (457) an old print of the ren Marshall Turrenne, remarkable for the lace; it is contributed by the Prince Co and (450) a picture of the Dutch school, A Woman Spinning, are exact fac-similes, a are Mrs. Verschoyle's, contained in (455), L seil Paternel, celebrated as the Satin Gow graved by Wille; Charles I., Napoleon I., St vanni, and two others, one after L. da Vin one after Raphael. (443) by Major Penric capital imitation after Mieris, L'Observ distrait, and (444) a picture by Brothers lished by the Manchester Society, the in (445) we have a fine copy, by Alinar fresco painting, Il Giudizio Univeisale. R mer's, (300 and 460) Studies of Flowers, (says the catalogue) from engravings, ar good. (465 to 476) are copies of drawin Raffaelle, &c., by C. T. Thompson, of th may notice especially, though they are al as far as the state of originals will permit Head of Avenging Angel, (379) Passage Red Sea, (381) Repulse of Attila, and (470) Beatrice. Dr. Becker's (572) Lion's Jaw are exceedingly interesting because th specimens of this application of the art t tomical purposes. (524) The Stothard by Hogarth, is good. (527 and 528) are by Contencin, of crayon drawings, une in their way, they are Dr. Newman and Long. Then we come to the artists of acter," first and foremost of whom com lander with his (65) Two Ways of Life we have already spoken of, and (340) W Amy, the disorder in question not bei indicated by the accessories, particular out of doors, but we presume it to b phase or other of the "old, old story." (309) Studies of Game, by Lake Pri hardly be lauded too much; he is very ful with knights, as in (279, 280, and 31 passing by his Temptation (494) we Mr. White's beautiful sunshine, which w to have noticed before. A lot of St Arabs, Fishermen, Ships, Tents, &c., Grundy (212 to 215, 229, 230, 584, (534) A Savoyard Itinerant Musician. are rather over painted, but otherw pictures, both in arrangement and effec

Before we quit this branch of our su may be permitted to recommend the of photographic printers to the beauti of some of the specimens of mezzotint ings in this exhibition, most of wh within their reach; we may give as e two by W. M. Turner, (1289) Windmill a (1303) Egremont Marine; this last an by the same artist are to some extent fully imitated, unintentionally no doub Le Gray in his sea and cloud pictures.

IE MANUFACTURE OF COLLODION.

By Edward Ash Hadow, Esq.

ɪdow's papers on collodion, read before otographic Society of London, are re- as standard authorities, and therefore a place in this *Journal*. An incomplete t of them only having been hitherto pre- to our readers, we have no hesitation in g it useful to reprint them in *extenso* ie Society's Journal.

Hadow says—"Having in my earlier nents on the collodion process of photo- experienced some difficulty in always ing a collodion of uniform quality with to sensitiveness, tenacity, and fluidity, gh making use of the same materials for paration, and this I find being the com- of many others, it has been my study to determine the variations in quality to the ingredients are liable, and the effects se variations on the sensitive film, and se to ascertain whether the excellent qua- of some samples of collodion depend on aterials in ordinary use, or on some sub- s accidentally or intentionally added. ches on the preparation of collodion may superfluous, now that it is supplied of st quality by so many makers, but as some ns of an independent turn of mind still manufacturing their own, I venture to forward the subject with the hope of tting these. In this beautiful process so depends for success on the quality of the ion, that when in possession of a good nen it becomes one of the easiest and most , and ought to be the most certain of all ocesses yet devised; for here no material ertain composition is introduced, such as , and thus we have nothing to fear from r of Paris, alumina, or specks of iron or r, which continually endanger or modify lotype process; each ingredient can and to be obtained in a state of perfect purity, *with this precaution*, the degree of success ds upon the skill of the operator himself.

"f all the substances used in this process, the cotton is usually the only one actually pre- by the operator himself; in this case he t fail to have observed the great varia- in solubility, and, when dissolved, in the parancy and tenacity of the films to which iable; the various processes also that are n appear at first sight unaccountably dif- t, some directing ten minutes', others a few nds' immersion. In consequence of this I specially examined into the cause of all variations, with a view to obtain certainty, also have endeavoured to discover how far affect the sensitiveness of the prepared ee. If we take a mixture of the strongest c and sulphuric acids and immerse as much on as can be wetted, after some minutes eze out the acid as far as possible, then im- se a second portion of cotton, and again ess the acids for a third portion of cotton, so on until the liquid is exhausted, we shall on comparing the cottons thus treated, after hing and drying, that there is a gradual ration in their properties, the first being ly and perfectly explosive, and each suc- ding portion less so, until the portion last immersed will be found hardly explosive, leaving distinct traces of charcoal or soot when burned. This may not appear surprising at first sight, as it may be imagined that the latter portions are only a mixture of gun-cotton and common cotton; this is, however, not the case, for if each quantity be immersed sufficiently long, it will not contain a fibre of common cotton, and may yet become charred on burning *like* unaltered cotton. The most remarkable difference, however, is discovered on treating them with æther containing a little alcohol, when, contrary to what might have been anticipated, the first or strongest gun-cotton remains quite untouched, while the latter portions dissolve with the utmost ease, without leaving a trace behind, which alone is a sufficient proof that no unaltered cotton remains. This difference in properties is owing to the gradual weakening of the acid mixture, in consequence of the nitric acid being removed by the cotton, with which it becomes intimately combined, at the same time that the latter gives out a proportionate quantity of water. In consequence of these experiments, a great many mixtures of these acids were prepared of various strengths, each being accurately known, both to determine whether there were more than one kind of *soluble* gun-cotton, and, if there were, to ascertain exactly the mixture required to produce that most suitable to photographic purposes. By this means, and by, what I believe has not been pointed out, *varying the temperature*, at least five varieties were obtained:—first, gun-cotton properly so called, as before stated, quite insoluble in any mixture of alcohol and sulphuric æther. Secondly, an explosive cotton, likewise insoluble, but differing chemically from the first, obtained by a mixture of certain strength when used *cold*. If *warm*, however, either from the heat produced spontaneously on mixing the two acids, or by raising the temperature artificially to about 130°, the cotton then immersed becomes perfectly soluble, producing a third variety; if, however, it be *thoroughly* dried it becomes in a great measure insoluble. The fourth is obtained by means of weaker acids used cold, and the fifth when the mixture has been warmed to 130° previous to the immersion of the cotton; in either of the two last cases the product is perfectly soluble, but there is a remarkable difference between their properties, for on dissolving six grains of each in one ounce of æther, the cotton treated with *warm* acids gives a perfectly fluid solution (which is likewise the case with the third variety produced by acids somewhat stronger,) while that obtained by the use of cold acids makes a mixture as thick as castor oil.

"Having obtained these more strongly marked varieties, as well as intermediate kinds with all gradations of solubility, it was necessary, before I could select any particular formula for preparing the cotton, to compare their photographic properties, with especial reference to sensitiveness, opacity of the reduced silver in negatives, and its colour in positives. A certain weight of each being dissolved in a portion of the same mixture of alcohol and æther previously iodized, the comparison was made, by taking the same objects with each collodion in succession, and likewise by pouring two samples

on the same plate of glass, and thus exposing them in the camera together side by side; this last proved to be much the most satisfactory plan, and was repeated many times for each sample, taking care to reverse the order in which they were poured on, that there might be no mistake arising from the difference of time elapsing between the pouring on of the collodion and its immersion in the sensitive bath. By these experiments I had confidently hoped to have solved the question as to the cause of difference in sensitiveness and other photographic properties of collodion; but in this I was disappointed, for, after repeated experiments, I believe I may safely affirm that they are precisely similar as regards their photographic properties. The same, I believe, may be said of Swedish paper collodion, judging from a few comparative experiments I have made, and indeed it is difficult to discover what is the superiority of this material over clean cotton-wool; the ease of manipulation which some allege, is a matter of taste, but I should decidedly prefer the open texture of cotton to that of a substance like filtering paper, composed of a mass of compacted fibres, the innermost of which are only reached when the acids have undergone a certain degree of weakening by water abstracted from the outer fibres; and when we consider that from cotton alone we have the means of preparing all varieties of collodion, from the most powerfully contracting and transparent to the weakest and most opaque, and each if required with equal and perfect certainty, there appears to be choice enough without resorting to another material, differing only in being more rare and more difficult to procure. But although the *photographic* properties of these varieties of collodion wool are so similar, other circumstances, such as fluidity, tenacity, and transparency, render its preparation of some importance, and indicate that the acid mixture should always be used *warm*; and it is chiefly in consequence of this very circumstance, that greater success attends the use of nitrate of potash and sulphuric acid than that of mixed acids; for the former, when mixed, becomes solid, whereas acids, when mixed, produce the required temperature, and *must* be used while warm, since on cooling the mixture becomes solid, whereas acids when mixed do not usually produce so high a temperature, and being fluid can be used at any subsequent period; another obstacle to their use is the great uncertainty of the strength of the nitric acid found in the shops, requiring a variation in the amount of sulphuric acid to be added, which would have to be determined by calculation or many troublesome trials. When a proper mixture is obtained, the *time* of immersion is of no importance, provided it be not too short, and the temperature be maintained at about 120° or 130°; ten minutes is generally sufficient, (though ten hours would not render the cotton less soluble, as is sometimes asserted).

In using the mixed acids, the limits are the nitric acid being too strong, in which case the product is insoluble, or too weak, when the cotton becomes immediately matted, or even dissolved if the mixture is warm. I have availed myself of these facts in order to produce a collodion wool by the use of acids, without trouble of calculating the proper mixture cording to their strength. Five parts measure of sulphuric acid, and four of ni acid of specific gravity not lower than 1·4, mixed in an earthenware or thin glass ve capable of standing heat; small portion water are added gradually, (by half-drac at a time, supposing two ounces to have l mixed), testing after each addition by the mersion of a small portion of cotton; addition of water is continued until a piece of cotton is found to contract and solve on immersing; when this takes pl add half the quantity of sulphuric acid viously used, and, (if the temperature d not not exceed 130°, in which case it must allowed to cool to that point), immerse as m cotton, well pulled out, as can be easily and fectly soaked; it is to be left in for ten minu taking care the mixture does not become c and then transferred to cold water and thoroug washed; this is a matter of much importa and should be performed at first by chang the water many times, until it ceases to t acid, and then treating it with boiling rain wa until the colour of blue litmus remains changed; the freedom from all trace of aci ensured by adding a little ammonia *before* last washing. Cotton thus prepared should solve perfectly and instantaneously in æ containing a little alcohol, without leavin fibre behind, and the film it produces be of greatest strength and transparency, being v M. Gaudin terms "rich in gun-cotton." mixture of nitrate of potash and sulphuric is defective chiefly from the want of fluidit consequence of which the cotton is less perfe acted on: this may be remedied by increa the amount of sulphuric acid, at the same adding a little water: a mixture of five par dried nitre, with 10 of sulphuric acid, weight, together with one of water, produc much better collodion wool than the ordi mixture of 1 of nitre with $1\frac{1}{2}$ of sulphuric The nitre is *dried* before weighing, in order its amount, as well as that of the water tained in the mixture, may be definite in q tity; it is then finely powdered, mixed wit water, and the sulphuric acid added; the c is immersed while the mixture is hot, and a wards washed with greater care even th required when pure acids are used, on acc of the difficulty of getting rid of all the b phate of potash that adheres to the fibres, w both acts as an acid and likewise causes th lodion to appear opalescent when held up t light; whereas the solution* should be perf transparent.

Having obtained good collodion wool, the point of enquiry was with regard to the sol to ascertain whether the addition of al beyond what is absolutely necessary to the solution of the gun-cotton in æther, beneficial or otherwise. For this purpose and alcohol were prepared perfectly pure, mixtures were made of 1 of alcohol to 7 of a 2 to 6, 3 to 5, 4 to 4, and 5 to 3. In one of each were dissolved 6 grains of gun-c

* Add from 10 to 15 drops of water to the iodide of pot when that salt has to be mixed with *pure* alcohol.—ED. L. & P.J.

4 grains of iodide of ammonium (iodide of ssium could not be employed, since it uires a certain amount, both of water and hol, to keep it in solution); they were then pared, using a 35-grain solution of nitrate of er, both by pouring on separate glasses, and wise by covering two halves of a plate with samples, as in examining the gun-cottons, placing them under the same circumstances ng the same time; in this way the effect dding alcohol was very clearly perceived, e the differences between the collodions was h greater than could have been anticipated. first mixture containing only one-eighth of hol was quite unfit for photographic pures, from its being almost impossible, even h the most rapid immersion, to obtain a film niform sensitiveness and opacity throughout, surface generally exhibiting nearly transent bands, having an iridescent appearance by ected light. The second mixture with onerth of alcohol is liable to great uncertainty, if there be any delay in pouring off the odion the same appearances are seen as in first, and like it the surface is very insensie to light, while if the plate be rapidly plunged the bath, the collodion film becomes much re opaque than before, and is then very senve. The third proportion of 3 of alcohol to f æther is decidedly the best, giving without least difficulty a beautifully uniform and hly sensitive film, at the same time perfectly gh and easily removable from the glass if uired. A further addition of alcohol, as in two last collodions, was not attended with corresponding advantage or increase of senveness; on the contrary, the large proportion lcohol rendered them less fluid, though with maller quantity of gun-cotton they would duce very good collodions, capable of giving n films: the cause of the weakness of the film erved on adding much of the ordinary alcohol the large amount of water it usually conns.

'This surprising improvement, caused by the lition of a certain quantity of alcohol, is erable to causes partly chemical, partly meanical; for on examining the films it will be nd in the first, and occasionally in the second lodion, that the iodide of silver is formed *on surface*, and can be removed entirely by tion without destroying the transparent collion film below, while in those collodions that tain more than ¼th of alcohol, the iodide of ver is *wholly in the substance*, and in this te possesses the utmost sensitiveness. This ference of condition is owing to the very aring solubility of æther in water, which in e first case prevents the entrance of the niate of silver into the film, consequently the dide and silver solutions meet on the surface; t on the addition of alcohol, its solubility ables the two to interchange places, and thus e iodide of silver is precipitated throughout e substance *in a state of the utmost division.* his difference is clearly seen under the microope, the precipitate being clotted in the one se, while in the other the particles are hardly iscoverable from their fineness. The presence f a little water considerably modifies these reults, since it in some degree supplies the place of alcohol, and is so far useful; but in other respects it is injurious, for, accumulating in quantity, if the collodion is often used, it makes the film weak and gelatinous, and what is worse full of minute cracks on drying, which is never the case when pure æther and alcohol are used. Since the æther of the shops almost always contains alcohol, and frequently water, it is important to ascertain their amount before employing it for the preparation of collodion; the quantity of alcohol may be easily ascertained by agitating the æther in a graduated measure glass (a minim glass does very well) with half its bulk of a *saturated* solution of chloride of calcium; this should be poured in first, its height noted, and the æther then poured on its surface, the thumb then placed on the top, and the two agitated together; when separated, the increase of bulk acquired by the chloride of calcium indicates the quantity of alcohol present, and for this allowance should be made in the addition of alcohol afterwards to the collodion. Water is readily detected, either in æther or alcohol, by allowing a drop to fall into spirit of turpentine, with which they ought to mix without turbidity; this is immediately produced if they contain water; for detecting water in *alcohol*, benzole is a more delicate re-agent than spirit of turpentine (*Chemist*, xxix. 203). It is also necessary that æther should be free from a remarkable property it acquires by long keeping, of decomposing iodides and setting free iodine, which thus gives the collodion a brown colour; the same property may be developed in any æther, as Schönbein discovered, by introducing a red hot wire into the vapour in the upper portion of a bottle containing a little æther and water; if it be then shaken up and a solution of an iodide poured in, the whole rapidly becomes brown; this re-action is very remarkable and difficult to explain, for even a mixture of æther and nitric acid fails to produce a colour *immediately*. Æther thus affected can only be deprived of this property by rectification with caustic potash.

"And here I would for the present conclude, purposing, with your permission, to proceed to the subject of iodizing, as well as that of the nitrate bath, on some future occasion.

[*To be continued.*]

Photo-chemical Researches.—Prof. Faraday, in the second edition of his work on "Chemical Manipulation," published fifteen years since, observes:—"There is another point relative to the admission of light to a laboratory, which, in the present state of chemical science, is worthy of consideration. The solar rays have been found highly influential in causing chemical change; they effect combinations and decompositions in a manner unattainable by any other agent, and are now frequently resorted to, not merely in the preparation of peculiar substances, as chloro-carbonic acid, chloride of carbon, &c., but also in the processes of analysis, where chlorine is an agent used in new experimental researches, and in many other photochemic and also photographic processes. It would be well, therefore, in the construction of a laboratory, to provide, if possible, for the *direct admission of solar light.*

AMATEURS' COLUMN.

Paper for Photography.—The mass of pulp having been beaten fine some four or five hours after the preliminary tearing, or grinding as it is called by some, becomes slightly warm, and by that time the linen fibres have been combed out into a mass of straight minute filaments; all is now ready for moulding into a sheet of paper. The short or long fibre-stuff is taken from the engine and put into a wooden trough or vat, where it is mixed with a sufficient quantity of warm water, to form a pulp of the proper consistency for moulding, and the whole is kept warm throughout this part of the process; it is also important that the mass should be kept stirred to prevent the pulp from settling or getting clotted. This stirring is sometimes effected by machinery, but in our case it was accomplished by a stout wooden hand-stick vigorously used. We now proceed to the actual moulding, but let us first describe the mould, and this we cannot do better than in the words of a writer on the "Manufacture of Paper" in one of the cheap publications of the Society for Promoting Christian Knowledge. "The mould consists of a neat frame of mahogany, with wooden bars running across it, at the distance of about an inch and-a-half from each other. Upon this frame-work is fastened a surface of wire-cloth woven for the purpose, and containing from forty-eight to sixty-four wires in an inch, varied according to the fineness of the paper and the nature of the pulp. The mould is furnished with a *deckle*, or moveable raised edging, which the vatman always holds in his hand; it is made to fit exactly all round the edge of the mould, and prevents the pulp from flowing over and leaving a rough edge. By means of this instrument, the *water edge* is produced, which, we may observe in passing, being different to the edge produced by any other means is generally adopted in the paper used for bank notes. The moulds are made of various sizes, corresponding with the sheets required. In making paper by hand two men are required at each vat, one is called the *vatman* and the other the *coucher;* the vatman is furnished with two moulds in order to save time, for while the coucher is taking off a sheet from one mould the vatman is filling the other. The vatman stands at one side of the vat, and the coucher nearly opposite to him, at the corner of the side on the vatman's left; between them, along the top of the vat, is a board called a bridge, with copper fillets fastened lengthwise upon it, along which the vatman slides the mould to the coucher. The stuff in the vat being properly prepared, the vatman takes one of the moulds, furnished with its deckle, by the middle of the short sides, and plunges it obliquely four or five inches into the vat, when, taking up a quantity of the stuff upon it, he raises it to a level, shaking it so as to distribute the stuff and form a uniform fabric; while doing so, he gradually raises the mould; the water escapes through the wires, and the superfluous stuff escapes over the sides of the frame. This operation, however, simple it may appear, is a very delicate one, and requires a long apprenticeship to perform successfully; the stuff requires to be very equally distributed over the surface of the mould, and the mould to be held perfectly level when taken out of the vat otherwise the sheet would be imperfect, or thicker in one part than another; the manner in which the "shake" is given is also of the greatest importance to the firmness of the paper. There are few men skilful and strong enough to keep up the proper action necessary to the well-felting together of the mass. As soon as a portion of the water has drained off the vatman raises the deckle and slides the mould, with the wet sheet upon it, along the bridge to the coucher, who places it for a few seconds in an inclined position, in order that any excess of water may drain off; meanwhile, he places a piece of felt or blanketing upon a wooden plank, and then taking the mould, presses the face of it upon the felt, which receives and takes off the sheet from the mould although still in a very wet state; the mould is returned to the vatman, who, by this time has filled his second mould, and is ready to give a second sheet to the coucher. The process is continued by piling up on each other, alternately, a sheet and a piece of felt till several quires of paper have been formed. The pile of felt and paper is then loaded with a heavy plank, and conveyed to a press where more water is squeezed out: when removed from the press the paper can be handled. The sheets are separated from the felts and placed together in a *pack*, while the felts are returned to the coucher and vatman, who proceed as before." We may here observe, that for our photographic paper experiment we had the finest wire-cloth we could well use, and the smoothest felts we could persuade the maker to adopt. The smoothness of the felt seems to us to be an important point, and in our next we shall say a few words about it, and describe how the paper is treated to make it smooth and uniform ready for sizing, for at present we have only obtained a very *rough*-looking species of blotting paper. M.

HISTORY OF PHOTOGRAPHY.

THE CALOTYPE OR TALBOTYPE.

(Concluded from page 164.)

"This process of the formation of a sub-chloride by the use of a very weak solution of salt, having been discovered in the spring of 1834, no difficulty was found in obtaining distinct and very pleasing images of such things as leaves, lace, and other flat objects of complicated forms and outlines, by exposing them to the light of the sun.

"The paper being well dried, the leaves, &c. were spread upon it, and covered with a glass pressed down tightly, and then placed in the sunshine; and when the paper grew dark, the whole was carried into the shade, and the objects being removed from off the paper, were found to have left their images very perfect and beautifully impressed or delineated upon it.

"But when the sensitive paper was placed in the focus of a camera obscura, and directed to any object, as a building, for instance, during a moderate space of time, as an hour or two, the effect produced upon the paper was not strong enough to exhibit such a satisfactory picture

building as had been hoped for. The outof the roof and of the chimneys, &c., against sky was marked enough, but the details of architecture were feeble, and the parts in le were left either blank or nearly so. The itiveness of the paper to light, considerable seemed in some respects, was therefore, as evidently insufficient for the purpose of ining pictures with the camera obscura; the course of experiments had to be again ewed in hopes of attaining to some more imant result.

The next interval of sufficient leisure which und for the prosecution of this enquiry, was ing a residence at Geneva, in the autumn of 4. The experiments of the previous spring e then repeated and varied in many ways; having been struck with a remark of Sir Davy's, which I had casually met with, that *iodide* of silver was more sensitive to light n the *chloride*, I resolved to make trial of the ide. Great was my surprise on making the eriment to find just the contrary of the fact ged, and to see that the iodide was not only s sensitive than the chloride, but that it was sensitive at all to light;* indeed that it was olutely insensible to the strongest sunshine; aining its original tint (a pale straw colour) any length of time unaltered in the sun. is fact showed me how little dependance was be placed on the statements of chemical iters in regard to this particular object, and w necessary it was to trust to nothing but ual experiment; for although there could be doubt that Davy had observed what he desbed under certain circumstances, yet it was ar also that what he had observed was some ception to the rule, and not the rule itself. fact, further enquiry showed me that Davy ist have observed a sort of subiodide, in which e iodine was deficient as compared with the ver; for as in the case of the chloride and bchloride, the former is much less sensitive, between the iodide and subiodide there is a nilar contrast, but it is a much more marked d complete one.

"However, the fact now discovered, proved immediate utility; for, the iodide of silver ing found to be insensible to light, and the loride being easily converted into the iodide immersion in iodide of potassium, it followed at a picture made with the chloride could be *ced* by dipping it into a bath of the alkaline dide.

"This process of fixation was a simple one, d it was sometimes very successful. The sadvantages to which it was liable did not anifest themselves until a later period, and ose from a new and unexpected cause, viz., at when a picture is so treated, although is permanently secured against the *darkening* ffect of the solar rays, yet it is exposed to a ontrary or *whitening* effect from them; so that after the lapse of some days the dark parts of the picture begin to fade, and gradually the whole picture becomes obliterated, and is reduced to the appearance of a uniform pale yellow sheet of paper. A good many pictures no doubt escape this fate, but as they all seem liable to it, the fixing process by iodine must be considered as not sufficiently certain to be retained in use as a photographic process, except when employed with several careful precautions, which it would be too long to speak of in this place.

"During the brilliant summer of 1835 in England, I made new attempts to obtain pictures of buildings with the camera obscura; and having devised a process which gave additional sensibility to the paper, viz., by giving it repeated alternate washes of salt and silver, and using it in a moist state, I succeeded in reducing the time necessary for obtaining an image with the camera obscura on a bright day to ten minutes. But these pictures, though very pretty, were very small, being quite miniatures. Some were obtained of a larger size, but they required much patience, nor did they seem so perfect as the smaller ones, for it was difficult to keep the instrument steady for a great length of time pointing at the same object; and the paper being used moist was often acted on irregularly.

"During the three following years, not much was added to previous knowledge. Want of sufficient leisure for experiments was a great obstacle and hindrance, and I almost resolved to publish some account of the art, in the imperfect state in which it then was.

"However curious the results which I had met with, yet I felt convinced that much more important things must remain behind, and that the clue was still wanting to this labyrinth of facts. But as there seemed no immediate prospect of further success, I thought of drawing up a short account of what had been done, and presenting it to the Royal Society.

"However, at the close of the year 1838, I discovered a remarkable fact of quite a new kind. Having spread a piece of silver leaf on a pane of glass, and thrown a particle of iodine upon it, I observed that coloured rings formed themselves around the central particle, especially if the glass was slightly warmed. The coloured rings I had no difficulty in attributing to the formation of infinitely thin layers or strata of iodide of silver; but a most unexpected phenomenon occurred when the silver plate was brought into the light by placing it near a window. For then the coloured rings shortly began to change their colours, and assumed other and quite unusual tints, such as are never seen in the "*colours of thin plates.*" For instance, the part of the silver plate which at first shone with a pale yellow colour, was changed to a dark olive green when brought into the daylight. This change was not very rapid: it was much less rapid than the changes of some of the sensitive papers which I had been in the habit of employing, and, therefore, after having admired the beauty of this new phenomenon, I laid the specimens down for a time, to see whether they would preserve the same appearance, or would undergo any furt[illegible] alteration.

* In a lecture at the Royal Institution we mentioned this atement of Mr. Talbot's, whereupon, at the conclusion of the scourse, Mr. Faraday was good enough to inform us that Davy ertainly knew of the *insensitiveness* of iodide of silver, for he ad mentioned the fact in Mr. Faraday's presence, while disussing with Gay Lussac, at Paris, the nature of iodine, then ecently discovered. Davy produced this fact as proving that dine was not likely to be a modification of chlorine; the hloride of silver being readily altered by the light, while he lleged iodide remained unchanged.—[Ed. L. & M. P. J.]

"Such was the progress I had made in this enquiry at the close of the year 1838, when an event occurred in the scientific world which in some degree frustrated the hope with which I had pursued, during nearly five years, this long and complicated, but interesting series of experiments—the hope, namely, of being the first to announce to the world the existence of the New Art—which has been since named Photography.

"I allude, of course, to the publication in the month of January, 1839, of the great discovery of M. Daguerre, of the photographic process which he has called the Daguerreotype. I need not speak of the sensation created in all parts of the world by the first announcement of this splendid discovery, or rather, the fact of its having been made (for the actual method made use of was kept secret for many months longer). This great and sudden celebrity was due to two causes: first, to the beauty of the discovery itself; secondly, to the zeal and enthusiasm of Arago, whose eloquence, animated by private friendship, delighted in extolling the inventor of this new art, sometimes to the assembled science of the French Academy, at other times to the less scientific judgment, but not less eager patriotism, of the Chamber of Deputies.

"But having brought this brief notice of the early days of the photographic art to the important epoch of the announcement of the Daguerreotype, I shall defer the subsequent history of the art to a future number of this work.*

"Some time previous to the period of which I have now been speaking, I met with an account of some researches on the action of light, by Wedgwood and Sir H. Davy, which, until then, I had never heard of. Their short memoir on this subject was published in 1802, in the first volume of the Journal of the Royal Institution.† It is curious and interesting, and certainly establishes their claim as the first inventors of the Photographic Art, though the actual progress they made in it was small. They succeeded, indeed, in obtaining impressions from solar light of flat objects laid upon a sheet of prepared paper, but they say they found it impossible to fix or preserve those pictures: all their numerous attempts to do so having failed.

"And with respect to the principal branch of the art, viz., the taking pictures of distant objects with a camera obscura, they attempted to do so, but obtained no result at all, however long the experiment lasted.‡ While therefore due praise should be awarded to them for making the attempt, they have no claim to the actual discovery of any process by which such a picture can really be obtained.

"It is remarkable that the failure in this respect appeared so complete that the subject was soon after abandoned by themselves and others, and as far as we can find, it was never resumed again. The thing fell into entire oblivion for more than thirty years; and therefore, though the Daguerreotype was not so entirely new a conception as M. Daguerre and

* "The Pencil of Nature."

† Re-published in No. 14 of this Journal.—[Ed. L. & M P. J.]

‡ The words used by Davy are "in any moderate time of exposure."

the French Institute imagined, and though m own labours had been still more directly antic pated by Wedgwood, yet the improvement were so great in all respects, that I think th year 1839 may fairly be considered as the re date of the birth of the Photographic Art: tha is to say, its first public disclosure to th world."

The *Pencil of Nature* was discontinued afte twenty-five plates, accompanied by descriptiv letter-press, had been issued. The history o the art was not alluded to in the subsequen parts of the work, except incidentally, as fo instance, at the end of the description of th fifteenth plate, which represents Mr. Talbot' residence at Lacock Abbey, in Wiltshire, whe we are informed that "It was in the summer o 1835 these curious self-representations [of th Abbey] were first obtained. Their size was very small; indeed, they were but miniatures though very distinct; and the shortest time of making them was nine or ten minutes."

A NEWLY DISCOVERED STEREOSCOPIC EFFECT.

By A. Claudet, Esq., F.R.S.

The following is an abstract, by the author of a paper recently read before the Royal Society and which is entitled—"*On the Phenomenon o Relief of the Image formed on the Ground-glass o the Camera Obscura.*"

Having observed that the image formed o the ground-glass of the camera obscura appear as much in relief as the natural object whe seen with both eyes, I have endeavoured t discover the cause of that phenomenon; an the result of my experiments and researches ha disclosed the singular and unexpected fact that, although only one image *seems* depicte on the ground-glass, each eye really perceive a different image, and that, in reality, tw distinct images exist on the ground-glass, on visible only to the right eye, the other visibl only to the left. That seen by the right ey is the representation of the object refracted b the left side of the lens, and that seen by th left eye is the representation of the objec refracted by the right side of the lens; conse quently, these two images, which present tw different perspectives, give a stereoscopic pe ception, as when we look through the stereoscop at two images of different perspectives.

It appears that all the different images r fracted separately by every part of the lens, ar individually only visible on the line of the refraction where it corresponds with the opt axis, and that, while we examine the image the ground-glass, if the head be moved, we lo the perception of all the rays which are n corresponding with the optic axis, and ha only the perception of those which, accordi to the position of the eyes, gradually happen coincide with the optic axis. So that, when w look precisely at the middle of the ground-glas the two eyes being equally distant from t centre, the right eye sees only the rays r fracted from the left of the lens, and the l eye only those refracted from the right of t lens. If the head be now moved horizontall so as to deviate about 6° from the centre on t right or on the left, in the first position, t

ht eye sees no image, and the left eye sees image which was seen previously by the ht eye, while in the second position, the verse takes place: of course, in both cases, ere cannot exist any stereoscopic illusion.

When the image of a solid object produced the entire aperture of the lens is examined, the focus be taken at the nearest point of the id, we perceive, on looking at the centre th both eyes, that the image is stereoscopic, d as soon as one eye is closed, the illusion of ief disappears instantly. The stereoscopic ect is beautifully brought out by the image a group of trees; and when experimenting an operating-room, it is rendered very conicuous if the image of an object having veral planes very distinct, such as the *focimeter*, taken. If, without altering the focus, the me image be examined with the pseudoscope, e effect is pseudoscopic; but if the focus has en set on the most distant plane of the cimeter, the effect is pseudoscopic, and it comes stereoscopic in looking with the eudoscope. The image loses its relief when is produced by the centre of the lens only; e stereoscopic and pseudoscopic effects are erefore as much less apparent as the aperture the lens has been more reduced, and they are e more evident if the image be produced by o apertures on both extremities of the rizontal diameter of the lens. This method conducting the experiments presents the ost decided manifestation of the entire phenomenon.

But it is a curious fact that if the image be ceived on transparent paper instead of groundass, it does not in any case present the slightt illusion in relief. The surface of the paper s the property of preserving to both eyes the me intensity of image, from whatever direcon the rays are refracted on that surface, and whatever angle the eyes recede from the ntre to examine the image. In fact, all the rious images refracted through every part the lens, and coinciding on the surface of e paper, are visible at whatever angle they e examined. The reason of this difference etween the effect of the ground-glass and that the paper is that, through the surface of the ound-glass, which is composed of innumerable olecules of the greatest transparency, but deived of their original parallels by the operaon of grinding (yet acting as lenses or prisms sposed at various angles), the rays refracted y the various parts of the lens continue their ourse in straight lines while passing through ese transparent molecules, and are visible nly when they coincide with the optic axis. ach molecule of the paper, becoming luminous, ends new rays in all directions; and, from hatever direction the paper is looked at, all e images appear superposed. So that, each ye seeing the two perspectives mingled, the rocess of convergence cannot take place, and o stereoscopic effect can consequently be prouced.

I have ascertained these facts by several experiments, the most decisive of which consists n placing before one of the marginal openings of he lens a blue glass, and a yellow glass before he other. The object of these coloured glasses is to give on the ground-glass two images, each of the colour of the glass through which it is refracted. The result is two images superposed on the ground-glass, one yellow and the other blue, forming only one image of a grey tint, being the mixture of yellow and blue when viewed with both eyes at an equal distance from the centre. But when the eyes are closed alternately, the image appears yellow and blue. This proves evidently that each eye sees only the rays which, after having been refracted by any part of the lens, and continuing their course in a direct line throughout the groundglass, coincide with the optic axis, while all the other rays are invisible.

The consideration of these very singular facts has led me to think that it would be possible to construct a new stereoscope, in which the two eyes, viewing a single image, could see it in perfect relief—such single image being composed of two images of different perspectives superposed, one visible only to the right eye, and the other to the left. This could be easily done by refracting a stereoscope slide on a ground-glass through two semi-lenses, separated enough to make the right picture of the slide coincide with the left picture at the focus of the semi-lenses. The whole arrangement may be easily understood, for we have only to suppose that we look through a ground-glass placed before an ordinary stereoscope, at the distance of the focus of its semi-lenses, the slide being strongly lighted, and the eyes seeing no other light than that of the picture on the groundglass. The whole arrangement is, in fact, nothing more than a camera having had its lens cut into two parts, and the two halves sufficiently separated to produce at the focus the coincidence of the two opposite sides of the stereoscopic slide placed before the camera.

THEORY OF THE DAGUERREOTYPE PROCESS, &c.

By A. Claudet, Esq., F.R.S.

M. Claudet has, from time to time, kindly furnished us with various interesting papers on photography, prepared by him for the Royal Society and other scientific bodies. We propose to-day, and on future occasions, to give a summary of his views regarding the "Theory of some of the Principal Phenomena of Photography in the Daguerreotype Process." The following questions are asked:—

1. What is the action of light on the sensitive coating?

2. How does the mecurial vapour produce the Daguerreotype image?

3. Which are the particular rays of light that impart to the chemical surface the affinity for mercury?

4. What is the cause of the difference in achromatic lenses between the visual and photogenic foci? Why do they constantly vary?

5. What are the means of measuring the photogenic rays, and of finding the true focus at which they produce the image?

In answer to the first question, M. Claudet observes that he has discovered, that the decomposition of the chemical surface of the Daguerreotype plate, by the action of certain rays of light, produces on that surface a white precipitate

insoluble in the hyposulphite of soda, which, when examined by the microscope, has the appearance of crystals reflecting light, and which, when seen by the naked eye, cause the appearance of a positive Daguerreotype image. This fact had not been observed before. The opinion of Daguerre himself, and other writers was, that the action of light on the iodide of silver had only the effect of darkening the surface, and consequently of producing a negative image. But it escaped them that under the darkened iodide of silver another action was going on, which prolonged exposure to the light and the fixing by hyposulphite of soda can disclose. This unexpected fact is proved by obtaining, by the action of light alone, and without mercury, images having the same appearance as those developed under mercurial vapour. This direct and immediate effect of light is certainly remarkable, but the Daguerreotype process is not founded on the principle here indicated, as will be evident from a consideration of the slowness of its action. Long before light can produce the white precipitate above alluded to, a wonderful action has taken place, by which the vapour of mercury is caused to attach itself to the chemical surface of the plate, in quantities varying with the intensity or extent of that action. The Daguerreotype image results from this action, which is the most beautiful feature of Daguerre's discovery. Analysis of the surface discloses the presence of mercury, and it is probable that this metal amalgamates with particles of silver reduced from the iodide by the action of light. Upon this opinion of M. Claudet's we must be allowed to remark, that the finding of mercury upon the plate does not prove that light liberates the iodine from the silver. A molecular change (as M. Claudet himself later observes) could be capable of causing the adhesion of the mercury, the iodine still remaining, or only removed by the subsequent action of the fixing liquid. This is still an obscure point. M. Claudet goes on to say, that it is probable that light exerts a two-fold action on iodide of silver, according to whether it is combined with chlorine or bromine, or not so combined. In the one case the iodide is decomposed, and the silver set free is precipitated upon the surface in the form of a white powder or small crystals; in the other, where the action begins much sooner, the parts affected by light have been simply endowed with an affinity for mercurial vapour. By means of a specially devised instrument it has been ascertained that the pure light of the sun performs, in about two or three seconds, the decomposition of the bromo-iodide of silver, which produces the white precipitate; while the same intensity of light determines the affinity of the same plate for mercurial vapour in the wonderfully short space of about 1-1000th of a second; so that the affinity for mercury is imparted by a proportion of light 3000 times less than that which produces the decomposition manifested by white pulverulent or crystalline precipitate. For this reason it is difficult to suppose that the two actions are the same. Long before light can affect the decomposition of the surface it imparts to the sensitive coating an affinity for mercurial vapour; and the result is the formation of the Daguerreotype image.

M. Claudet next discusses the particular p[roperties] of the differently coloured rays in relati[on] to the Daguerreotype plate. An account [of] this discussion will occupy us in the followi[ng] number.

To be continued.

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR, — After reading Mr. Shadbolt's Paper [on] Positive Printing, with a new toning agent, pu[b]lished in the *Liverpool and Manchester Photograp[hic] Journal*, March 15th, 1857, page 63, I felt v[ery] anxious to try his method, so I went to get so[me] *sulphide of ammonium*, but was told by a respecta[ble] chemist and dealer in photographic chemicals tha[t I] could not get it in Manchester; but not cont[ent] with that, I tried at another shop, and got some st[uff] sold under that name which entirely destroyed t[he] picture, after the ammonia had been applied [as] directed. I wish to know if you would be ki[nd] enough to inform me (through the *Journal*, a[s it] may be of use to others,) how to make it, if is ea[sily] made, and if not, how or where I could get some.

Yours truly,

R. B., AN AMATEUR

[The sulphide of ammonium is not easily made [by] those unacquainted with chemical manipulation. [It] is prepared by passing sulphuretted hydrogen gas [in] excess into a solution of caustic ammonia. To t[his] compound an equal bulk of caustic ammonia is to [be] added. The liquid commonly sold contains the s[ul]phuretted hydrogen in excess, and it also contai[ns] dissolved in it, sulphur, which is liberated by [the] action of the air upon part of the sulphuret[ted] hydrogen. The dissolved sulphur causes the liq[uid] to assume a yellow tint, which is characteristic of [a] more highly sulphuretted compound. Any ven[dor] of the preparations used in chemical analysis [will] supply you. Dilute it enormously for use. — ED. [L.] & M. P. J.]

ANSWERS TO CORRESPONDENTS.

T. R. T.—The photographic room at Rouen [is] about 18ft. by 10ft., and its height to the commen[ce]ment of the roof about 7ft. The ends and south [side] were of board. On the north side the light ent[ered] down to within 3ft. or so of the ground. In this [was] a swing window opened to admit air. There w[ere] thin blue linen curtains running, by means of ri[ngs], upon a rod, and placed at each end of this north [side], so that the light could be diminished except wh[en] the window opened. Thus a square mass of n[early] horizontal light was obtained, and this came [ob]liquely upon the sitter's face. The roof was a ri[dge] one, being of board to the south and of glass to [the] north, through three-fourths of its length, t[he rest] being wood over the sitter's head. There were [blue] curtains, on rods, placed at the ridge and eave of [the] north side, so that a square mass of light could [fall] obliquely from above upon the sitter's face, and [this] mass could be made to fall still more obliquel[y by] moving the curtains to the end of the room fart[hest] from the sitter. The wood work was coloured w[hite] excepting at the end opposite the sitter, there it [was] blue and sombre. There was a grey-looking m[ove]able screen in the room, which could be place[d on]

shadow side of the face so as to screen off the :e light sent from the boards, which were, of :se, on one side of the sitter. It is doubtful if in don we could operate with so little light, but in country, in good weather, we are sure good pic- :s could be obtained by thus concentrating the :f mass of light.

'AYLIGHT is informed that at present we are in :h the same predicament that he is. We can e the information we promised to obtain—on ing for it!—but then we are not to publish it as t would stop others from paying! However we not cease our inquiries till we get some trust- thy account. Very fine powder colours applied are, we believe, used successfully.

'. C., CORNWALL.—Your communication was doubly directed. We have sent it to an agent of the *rnal.*

. B., MANCHESTER.—The defects you complain of arise from the nature of the collodion. Try an collodion. The bleaching liquid is perhaps a ition of bichloride of mercury. A portrait lens do for landscapes just as it is, only placing a stop re the lens. If your question implies a separa- of the lenses, our answer is we do not approve t. Get a proper lens, or consult the maker of one you have.

. S. D., HUNTINGDON. — Your specimen is the t we have seen by the bichromate process. The f-tints are smooth, but the dark parts want vigour. tint is agreeable, but wants brilliancy. We shall glad to hear of your further progress. M. Sella's cess is claimed for a Mr. Perry. We are not uainted with the deposit you speak of, and there- cannot satisfactorily advise you. Can you filter a portion and press it in blotting paper for trans- ssion by post.

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Printed by the Proprietor, HENRY GREENWOOD, of No. 14, Fairfield Crescent, in the Parish of West Derby, a is Office 32, Castle Street, Liverpool.—August 15, 1857.

THE LIVERPOOL & MANCHESTER

Photographic Journal,

ed by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

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The
iverpool & Manchester Photographic Journal.

New Series. No. 17.—SEPTEMBER 1, 1857.

iave to-day resumed a practice followed by arly conductors of this *Journal*, viz.: the g a summary of all important papers or rks contained in the official reports of the us photographic societies. We deem this to be of unquestionable utility. The rity of our readers only casually see other als; and those who are more fortunately ted, do not always care to wade through thing that is within their reach. The tion is fatiguing, and not always satisfac- We shall do our best to assist them, and e same time take the liberty of occasionally ding upon their notice our own comments e way of elucidation or of suggestive criti- The French and Scotch Societies will be treated in this way in the present publi- n.

the spring of the year we visited, at Paris, Photographic Exhibition of the French ty; but at that time we had no conception our notes of what we then saw might be available for publication. However, the rance of the Society's report of the same ition has made us determine to resuscitate notes; for we see we can comment use- upon the labours of the commission nted by the French Society. We agree them that the powers of paper have not een exhausted. The chief difficulty is to *ood* paper. We wish some enterprising r would earnestly take the matter up. We d be very happy to aid in discussing the exed points; for having been so long in ct with the subject, we have many facts h might be of service to any one com- ing the investigation. We feel quite con- d that a day will come when paper will r to supersede dry processes on glass, and wet ones too. The wax-paper processes rto employed have never excelled the itive Talbotype in vigour and gradation nt. Probably the best paper process ex- is the wet one by Tanner, popularised M. Blanquart, Evrard, and others, but ited by Mr. Tanner. It is rapid, gives ge well, and affords vigorous negatives, h have, as we think, more half-tint than e obtained by any other paper process. regard to sharpness and smoothness of on paper, M. Bayard once admitted to us his practised eye could not detect that a in positive taken from a Talbotype nega- was not from glass. M. Bayard said that hought we in England had anticipated M. ce de St. Victor in the use of albumen.

We beg to direct our readers' attention to M. Belloc's copying frame, the drawings and descriptions of which we owe to the *Journal of the Photographic Society*.

We have received a circular from Messrs. Harvey and Reynolds, of Leeds, drawing attention to the great danger which attends the careless use of cyanide of potassium. They advise that in a case of accidental imbibation of the poison, removal into the open air, tickling the throat to produce vomiting, cold water thrown upon the head, and smelling at ammonia, should be resorted to until medical aid can be obtained.

We have only just received the announcement respecting the admission of pictures to the forthcoming Exhibition of the Birmingham Photographic Society. Photographs in every sense of the term, together with any new kind of apparatus, may be sent to the Gallery, Odd Fellows' Hall, Birmingham, on or before Sept. 5th, addressed to the Hon. Secretary of the Exhibition Committee, Mr. W. B. Osborn, who will give any further information required. We may add that each picture must have the name and address of the exhibitor written on the back; the name of the photographer, the subject, and the process employed on the front. Positive prints touched or coloured *must* be accompanied by an untouched copy. Unframed prints will be admissible. The margins of mounted pictures must be as small as possible. A letter containing a list, &c., of the pictures, and any details respecting the process, should accompany whatever is sent.

The Cleansing of Photographic Glass.—How varied are the recipes and instructions given by different operators on this head! Water and a cloth only; whiting, and water, and a cloth. Tripoli and water; tripoli, ammonia, and spirit of wine; tripoli and ammonia only. Rotten stone and ammonia. These are amongst the mild remedies, and which all succeed in the hands of their respective manipulators; perhaps good glass and carefulness are the foundations of success. The more energetic spirits treat their plates with nitro-sulphuric acid; nitric acid and a tooth-brush; sulphuric acid, and extemporaneous nitro-sulphuric acid, by sprinkling powdered nitrate on the plate and then adding oil of vitriol. Others insist that alkalies are the thing, and accordingly recommend caustic potash, lime, or simply ordinary pearlash and soda. But the list is not yet exhausted, and we are told that if we wish to ensure a clean plate, we must, in addition to any one of the above agents, no matter how

energetic, finish with strong cyanide of potassium. Having lately spent three or four days out of London, we, by way of relaxation, made experiments in positive portraiture, and were necessarily led to reconsider the present subject. On the score of convenience, effectiveness, and economy, we decided to use a mixture of *whiting and cyanide of potassium* moistened with water, and after this we had not a single failure from dirty glasses. Some of the plates used had films on them which had remained since last year, yet these were readily brought into working order. The cloths used in wiping them were not specially washed; of course they were ordinarily cleansed. Perhaps the fact is, some samples of glass, may, *at first*, require treatment with acid; but this once done the whiting and cyanide of potassium will do the rest. This method has the advantage of also cleansing the fingers of those who are methodical enough to assist in cleansing off at the *end of each day* the films not required to be kept. A piece of rag dipped into the almost pasty mixture was used to apply it to the glass. The rinsing was performed in running water.

M.

AMATEURS' COLUMN.

Paper for Photography.—We have seen that the moulded sheet is removed from the wire surface of the mould* by pressure upon a piece of coarse woollen cloth or felt. This felt is purposely chosen of a coarse texture. On first witnessing the moulding operation I at once suggested that a smooth cloth should be used to receive the still plastic sheet, but I was met with the objection, that the pulp would not leave the wire cloth of the frame unless a *coarse* surface was applied to it. I was assured that this was a recognised fact, and that nothing was to be done but to accept the universal practice. It was evident to me that there was a radical defect in the process of manufacture for photographic purposes; for not only was there the irregular surface produced by bringing the upper side of the moulded sheet in contact with the first sheet of felt, but the comparatively smooth condition of the side hitherto only in contact with the wire-cloth was next indented and roughened in various ways by pressing upon it a second piece of coarse felt, which in its turn was, by its upper surface, to indent the next newly-moulded sheet—and so on to the end. To alleviate my anxiety, I was told that all the alarming appearances that now presented themselves would disappear under future manipulations. This statement I did not believe; for I was looking to uniformity of *texture*, and not merely to a seeming uniformity of *surface*. I foresaw that the irregularities in thickness could never be subsequently equalized, however much they might be disguised by being *compressed*. A little consideration will shew the magnitude of this evil. Let us suppose the still plastic sheet to be equal in thickness, and otherwise uniform, and now examine the *brand* with which it is stamped or embossed! The felt surfaces present an irregular series of cavities and projections distributed at ha[...] It may, and does, happen that a projectio[...] the lower felt is opposite to a projection i[...] upper one, here the soft pulpy mass is n[...] perforated, and here the sheet is deficient in [...]stance; adjoining this thin place, or not fa[...] the felts have their cavernous portions s[...]ranged that a little knot of pulp is, by the [...]sure around, forced into both cavities, like [...] in its shell. Here the sheet is obviously th[...] than the desired medium. Of course, in [...] places the hollows and projections may so [...]cide as to leave the thickness unaltered, bu[...] embossing thus produced is painfully ev[...] to the sensitive experimenter. By rep[...] *pressings* and *partings* of the *pack* of sheet[...] inequality is attempted to be diminishe[...] far as the surface goes. We shall subsequ[...] see further mischief arising from this rude [...] of procedure. Before proceeding to des[...] the manipulation following the moulding [...] pressing, I would observe that, at a later p[...] I proved that a *rough* surface was not ess[...] to the removal of the pulp from the moul[...] I *couched* a sheet upon *glazed* blotting-p[...] and, even by attaching a strip of blotting-[...] to the upper *edge* of the sheet, I could strip th[...] from the mould, and suspend it to dry. Extr[...] are said to meet; and it may be that the [...] woollen cloth is not fine enough to allow [...] superior adhesive action coming into play. [...] coarse felt probably acts only by entanglin[...] pulpy mass. The pile of sheets which hav[...] been removed from the felts, and subject[...] further pressure, constitute a *pack*, whic[...] to be *parted*—that is to say, each sheet [...] damp, has to be stripped of the pack, and [...] pack formed, to be pressed as before. A s[...] parting takes place, and a new pressin[...] these operations are repeated five o[...] times, with a view to counteract the ill [...] of the rough felts. The paper also bec[...] more compact by this singular species of [...]pulation. At this stage of the process [...] genious use is made of the princip[...] *elasticity*. The pack covered by a boar[...] ceives the power of the press throu[...] moveable upright bar of wood, which is s[...] placed upright between the top of the [...] and the pack, of which latter, indeed, it fo[...] part. After the sheets have undergone [...] hours pressure in the pack, they might [...] moved by simply unscrewing the press[...] then there is a chance that the sheets [...] found adhering so strongly as to tear [...] process of separation. I had learnt tha[...] was the case, and was accordingly anxi[...] see how our new linen paper would b[...] The time for the removal had arrived—th[...] was about to be unscrewed, when su[...] the master of the works exclaimed, "[...] away the *Sampson*." The press was le[...] touched, and a good sledge-hammer ins[...] applied to the upright bar, which, on a[...] of its *instantaneous* release, allowed the [...] mass to spring up visibly, and occupy a [...] bulk than if the pressure had been slowly [...] drawn. Each sheet now parted readil[...] perfectly, and had only to be dried to re[...] fit for sizing, an operation to be discussed [...] next number.

* In the last number, through a misplacement of the mark of quotation, my remarks on the moulding operation seem to be copied from the source of the description of the mould. M.

HOTOGRAPHIC SOCIETY OF SCOTLAND.

ordinary meeting of this Society was held he 14th of July, W. WALKER, Esq. in the r. Papers by Mr. Cosmo Innes, Mr. Colin lair, and Mr. Lamb, were read.

r. TUNNY exhibited pictures printed on s, parian, and porcelain. These pictures t be looked at as transparencies, or in the nary way.

r. M'CRAW also showed specimens of a ess giving very similar results to those of Tunny, and which he intends to patent.

r. BURNETT, after the exhibition of these imens, remarked that he had been long ng to stir up photographers to immortalize r works by means of porcelain, glass, and lar imperishable materials.* He was much sed with these specimens in which glass, porin, and allied substances were used to support photographic film; yet, to give photography, uch materials, its *only* real and characteristic ne, the photograph *must be burnt in.*

he great difficulty in this, and the main e of the failure of the attempts at burnt-in tography which had hitherto been made, eeded from the change of colour which the er photograph underwent in the process of ing,† becoming yellow in most cases. hing stood more in the way of photographic gress here as well as elsewhere, than the deon which [some] photographers seem to be essed with, that everything must be done silver. Uranium, cobalt, chromium, antiy, lead, copper, titanium, tungsten, molybum, gold, and many other substances were likely to be much more extensively useful photography on porcelain, &c., than silver . In such an art we must direct our attenexclusively to the colour which the photophic substance would yield after burning, s every day done in enamel and porcelain ting], and not to that which it had before ing. It would be found that the two were om the same and generally entirely different. had been engaged for the last two or three rs in experiments, partly to try whether he d not, for our ordinary paper prints, get a costly material than silver, and one more e depended on for permanence, but also in eat measure with a view to photography on s, porcelain, &c. Mr. Burnett then exhid a few specimens of photography with per, manganese, cobalt, iron, molybdenum, , but the report does not state whether they e burnt in on either glass or porcelain. cimens of old ink processes were also shown, in which a mixture of tannin with carbonate mmonia had proved to be a better deveer than gallic acid. These processes were, vever, too slow to be recommended, and with bichromate and iron Mr. Burnett had not n so successful as M. Sella, but he advised use of tannin and carbonate of ammonia as a developer in the place of gallic acid, and recommended the addition of a very minute quantity of acid, or an acid salt, say bitartrate of potash, to the water used in washing out the iron salt of M. Sella's process.

Mr. COLIN SINCLAIR gave an account of his "*Experiments on the various Adhesive Substances used in Mounting Photographs as affecting the Permanence of the Prints.*" The mounting of photographs is so simple an operation at first sight, and so uninteresting a subject, that an apology might have been necessary in bringing it before the Society, were it not for the impression that has prevailed that the fading of photographs is more or less connected with the mode of mounting them, and that the adhesive substances used frequently prove fatal to the permanence of the picture. This impression induced Mr. Sinclair to try one or two simple tests to ascertain as far as he could which was the best material, and the one least likely to prove injurious. The substances in most general use are starch, albumen, isinglass, and gum arabic. Although the latter had been frequently condemned, it was thought that it might prove to be the best, on account of its property of keeping perfectly sweet when in a solution made with *boiling* water. Gum dissolved in cold water and kept soon begins to emit a bad odour. To test the matter fully a small quantity of the various cements was placed separately in dishes, and two of Mr. Tunny's photographs selected, one of them of the brown tint on albuminized paper, the other of the black tint on plain paper. Mr. Tunny's photographs were chosen because it was known that they had been subjected to a great deal of washing, and were, therefore, likely to be very free from hyposulphite of soda. Each print was cut into five pieces, the fifth piece being laid aside for future comparison, and the other four distributed over the four dishes containing the adhesive materials, so that there were two pieces completely immersed in each dish. They were kept there for one month. They would have been kept longer, but they had become so fragile that it was with difficulty they could be removed from the dishes. The pieces were mounted and laid before the Society. It was observed that the brown photograph on albuminized paper had suffered the most, especially the piece that had been immersed in the albumen: the pieces that had been in the isinglass and starch were slightly affected; that in the gum was the least changed of any, while the black picture on plain paper came out of all the substances not sensibly altered. This last specimen had been thoroughly printed into the paper, so much so that the picture was nearly equally distinct on both sides. A less severe test was next tried. Two other photographs were selected and cut into five pieces as before, one of each being put by for comparison, and the rest mounted separately with the four substances already named. The mounted pictures have been kept two months in a damp cellar, and have not yet shown signs of any change. They will, of course, require to be thus kept much longer before any useful conclusion can be drawn. It appears so far evident that the gum is as safe as any of the substances

We were the first to show that porous porcelain could be sed in photography. It was thought that translucency and sity could not co-exist, until our experiments made in 1850 onstrated the contrary.—ED. L. & M. P. J.

Our experiments were checked by the difficulty of obtainflat and uniform plates, since then other pursuits have ned our chief attention; but we do not intend to throw away rely the results of our somewhat costly experience.— L. & M. P. J.

employed even if not more so. The only objection to it is, that it penetrates the paper where the size has been removed by washing and causes a freckled appearance; but this may be avoided by the application of a soft sponge with clean water to the face of the picture, so as to equalize the moisture of the whole mass. However, clean starch may be the best to use when the paper has become bibulous from excessive washing; there can be little fear of the starch being injurious so long as the picture is kept free from damp, for it is that agent which lets loose some element that proves destructive to the picture. It will be wise to avoid damp walls, damp books, and damp rooms.

Mr. LAMB submitted to the consideration of the Society the result of some experiments made with impure ether supplied to him by a respectable firm in London some months ago. The density of the ether was .735; it was perfectly neutral to test paper; the alcohol was the same, and of sp. gr. .800; the cotton and iodide of cadmium were excellent; yet collodion made from these material blackened all over on applying the iron developer. It was at first supposed that the nitrate bath was alkaline; nitric acid was added without advantage. The bath was evaporated to dryness, and the silver salt redissolved, still the reduction of the silver took place on using the developer, even when the plate had not been at all exposed to light. Attention was now turned to the collodion. Free iodine, bromine, sulphuric, nitric, acetic, and formic acids were added respectively to no purpose. Ammonia and the alkaline carbonates were then tried with no better success. Certain essential oils were added to good collodion to see if they might cause "fogging," but no injurious result was obtained. Fluoride of potassium was next tried, it arrested the blackening, but produced in a day or two an effect equally injurious, viz:—a spotting over the picture. This took place only in positive portraits; *negatives* taken with it *never* spotted but had increased opacity in the lights, the film, however, was less sensitive. The fluoride destroyed all colour in the collodion, and caused it to remain perfectly white for the eight months it was in use, iodide of cadmium being employed as the iodizer. After various unsuccessful efforts to prevent the spotting of the positives the collodion was distilled, and the mixed fluid used again with complete success. The unused ether was now taken in hand and distilled off fluoride of potassium, quick lime, carbonate of potash, ivory black, and bromine respectively, with no improvement, at last iodine was tried and found to answer, excepting as to the colour thereby imparted; but even this last difficulty was removed on mixing a small quantity of ivory black with the iodine and ether previous to re-distillation.

What are the chemical changes involved in this remarkable curative process, and how far may this remedy apply to other cases? These questions Mr. Sinclair leaves for others to answer. In conclusion he begs of those who are not familiar with chemical manipulation to use the greatest caution in re-distilling ether. The retort was supported in a water bath the temperature of which was *never higher* than 173° Fahr.

SOCIETE FRANCAISE DE PHOTOGRAPHI[E]

From the August number of the *Bulletin d[e la] Société Francaise de Photographié* we learn t[hat] the last meeting for the season was held on [the] 16th July, M. DURIEU in the chair.

M. VIOLIN presented, through M. Girar[d, a] paper "*On a New Process for Printing Positive[s on] Collodionized gelatined-paper.*" The following [ad]vantages are obtained:—1st. The positives [are] equal in delicacy to the negatives from wh[ich] they are copied. 2. The strength of the pr[int] is so little affected by drying that it is poss[ible] to judge of it with certainty when in the hy[po]sulphite bath. 3. Contrary to the results [of] ordinary paper the print preserves on dry[ing] that charm which it possesses when immer[sed] in water: varnishes and encaustics, ol[ten] dangerous, are henceforth superfluous. 4. [Me]tallic spots arising from the paper do not occ[ur]. 5. The image being entirely in the collod[ion] and separated from the paper by a coating [of] gelatine, appears to have all the conditi[ons] necessary to its complete stability. M. Gir[ard] exhibited a great number of impressions ta[ken] by M. Violin, which were attentively exami[ned] by the society.

M. DURIEU asked if the red tones observ[ed] in the prints were inherent to the process.

M. VIOLIN replied that he had simply fi[xed] those with fresh hyposulphite of soda; bu[t it] was easy to colour them by the salts of gol[d].

The following is the process:—

Into a bottle containing

Ether ....20 cubic centimetres.*
Alcohol ....20 " "

Drop gradually a saturated solution of sala[m]niac, until a flocculent precipitate is produc[ed]; shake well and filter; add this liquid to a [col]lodion thus prepared:—

Ether ....100 cubic centimetres.
Alcohol............ 20 " "
Pyroxyline ...... 2½ grammes.†

Pour this mixture upon a glass plate, and [im]merse in water containing two per cent. of s[...], until all greasiness disappears. While in [the] bath take a sheet of paper gelatined b[y a] solution containing four per cent. of gelatine [and] two per cent. of sal ammoniæ, and make it adh[ere] to the film by M. Bayard's method of man[ipu]lation.‡ Remove the whole from the bath [and] allow to dry. To use this paper remove it f[rom] the glass by means of a bath of distilled wa[ter], then blot off, by paper kept specially for [this] purpose, and place the sheet, still slightly da[mp], upon the nitrate bath in the ordinary man[ner]. Remove and blot in another portion of blott[ing] paper, and leave to dry. The paper [dries] quickly and may be used within half-an-h[our]. Copy and fix in the usual manner.

The paper may be kept in a portfolio [after] removal from the glass; but it will in that [case] be necessary to immerse it in distilled water [for] some minutes, so as to moisten it previousl[y to] its exposure on the nitrate bath.

M. TILLARD communicated the latest part[icu]lars respecting his *New Wax Paper Pro[ces]s*,

* The cubic centimetre and the gramme of water agree in [...]k. 32 c.c. equal 1 fluid ounce, or, more exactly, 777 g.s. equal [...]c.
† The gramme 15½ grains.
‡ We have received this too late to refer at present [to M.] Bayard's process.—ED. L. & M. P. J.

ich is highly spoken of by M. Lespiault. e negatives obtained by it are very vigorous, ll defined, close in texture, and free from nulation. The picture developes well in lic acid, the whites keeping very clean and blacks possessing great intensity, all the ults promised having been realized. The servation of translucency in the negative is onishing, and has not been equalled in any er process. M. Tillard's method is simple l easily put into practice. It is believed that will become popular. The process is as ows:—

Oil of Turpentine ......2000 grammes
White wax .... 100 „

lt the wax in the turpentine in a water bath; w to stand twelve hours, then filter. Add to filtrate one, or perhaps better, two per cent. iodine, when combination will take place with rvescence. Add to this ten per cent. of cold ssed castor oil. The paper passed through bath of this becomes transparent, acquires firmness of parchment, and does not stain long immersion in the gallic acid. The per may be at once made sensitive, but as the posure in sunshine must be five or six minutes, s desirable to submit it to a second operation which the exposure in the camera with a lens bout thirty inches focal length may not exceed ee minutes, or even in full sunshine, *one nute.*

Iere is the formula:—

Vater, or better, milk serum 1200 grammes
odide of potassium............ 24 „
Bromide of potassium......... 6 „
Albumen (of about ten beaten
eggs) .... 340 „

soon as the iodized turpentined-wax-paper (*pier térébenthino-ciré ioduré*) is perfectly dry nerse it in the above bath. The sheets may placed one upon the other, avoiding air bbles. Fifteen minutes immersion is suffi-nt, but they may remain longer. The paper hen hung up, as in the first operation, to dry. piece of blotting-paper must be attached the bottom of each sheet to facilitate the ing.

The sensitive bath is to be thus made:—

Nitrate of silver .... 20 grammes.
Nitrate of zinc............... 10 „
Citric acid (or acetic) ...... 10 „
Filtered rain water* ......500 „

The sensitive bath should be prepared two three days beforehand. The paper is here to left for about four minutes, then wash in waters. If the bath is used for paper ving the double preparation kaolin must be d. [(?) to discolourize.]

This is the formula for the developing bath:

Saturated solution of gallic acid 50 grammes
Rain water [(?) distilled] ...... 50 „

d to this five or six drops of the above de-ibed nitrate bath, some of which is kept rposely for this use. Be very careful not to l too much silver, for the coarseness of the age is occasioned by the use of too much eto-nitrate, as also by the too great strength the gallic acid solution. The beauty of the ture must not be sacrificed to haste in the velopment. In support of this view two pictures were exhibited, one developed with but little silver, the other with a stronger dose. This process yields perfectly opaque blacks with perfectly clean shadows. The papers prepared by this process keep good for a long time both before and after their being made sensitive. They are perfectly white, the presence of iodide not being observable.

(?) Distilled water in smoky towns.—Ed L. & M P J.

M. Tillard next made mention of a sort of tracing paper called "vegetable paper," which has been used successfully. The image penetrates it completely, and the blacks given by it, when viewed by transmitted light, are very fine. It was introduced by M. Romain.

It is to be prepared as follows:—

Milk serum...............1500 grammes.
Iodide of potassium ... 50 „
Cyanide of potassium 1 „
Camphor, a small piece.

The addition of the camphor *preserves the bath*, which otherwise would soon spoil. The sensitive bath is the same as for the turpentined-wax-paper. In developing the image add to the gallic acid bath a few drops of a saturated solution of acetate of lime. The exposure in sunshine is from one to three minutes as with the preceding paper. This vegetable paper has the double advantage of not staining and of preserving its strength throughout all the manipulations. A negative by this process was also sent.

M. Bayle Mouillard thought that the castor oil was in excess, and that the paper would remain greasy, but M. Tiliard adheres to his proportions.

[*Apropos* of the greasiness of castor oil, we, six or seven years ago, made a negative transparent with castor oil, using the warmth of a fire to make it penetrate. We then wiped off the excess of oil, and rubbed the negative with *flour* and a piece of flannel. The negative is still good, and not at all greasy.—Ed. L. & M. P. J.]

M. de la Blanchere exhibited a photographic tent which could be set up in ten minutes and taken down in five. It weighed about eight pounds. Two persons could work beneath it at one time. It is well adapted for the practice of wet collodion.*

M. Millet, on a former occasion, presented for the consideration of the Society, a mode of mounting the double object glass of the camera. A sub-committee, consisting of MM. Durieu, Silbermann, and Bertsch, was appointed to examine into the utility and novelty of the arrangement. A favourable report was now read. A great advantage of the method was the ease with which the double glass could be so disposed as to use part of it as a single combination. The placing of a diaphragm between the lenses was also discussed, and it was observed that neither M. Millet nor M. Tamin could claim priority, for M. Victor Chevalier had used that particular arrangement in 1846, and as long ago as 1840 M. Buron, by the advice of M. Fortier, adopted a similar mode of construction. M. Tamin had popularised the the thing by being the first to throw into

* This is important; for hitherto the chief of the finest pictures have been obtained by *wet collodion*, as the pictures by Bisson Freres, Fenton, Bedford, and others testify.—Ed. L. & M. P. J.

commerce a great number of such combinations, and those at a cheap rate and easy of management.

After the reception and reading of some further communications of less pressing interest, and the appointment of a sub-committee to examine into the merits of a new head-rest and a new copying frame, the general meetings of the Society were adjourned until the 16th of October next.

MANUFACTURE OF COLLODION.

By Edward Ash Hadow, Esq.

Concluded from p. 173.

Part II.—*Iodized Collodion and Nitrate Bath.*

"In my former paper I confined myself to the subject of simple collodion, endeavouring to point out the precautions that are necessary in order to obtain a highly fluid solution, capable of giving a film, tough and transparent, without being deficient in photographic qualities. I have now a few remarks to offer on the modes of iodizing or rendering the film capable of becoming sensitive, by the addition of some soluble iodide; those that have been recommended are chiefly the iodides of potassium, ammonium, cadmium and zinc; of these the three last have the great advantage of being readily soluble in any collodion, and may therefore be added at once to the solution of gun-cotton; but iodide of potassium requires a little water, and even then, if added to collodion without having been previously dissolved in some of the alcohol, will be found to dissolve but very slowly. In preparing collodion with this salt, four grains were dissolved in three drachms of strong alcohol, and æther was added to make up the ounce: I found that the first two-and-a-half drachms of æther began to precipitate the iodide, and after the addition of the five drachms required, a dense deposit had formed, which was not redissolved until twelve drops of water had been added. This I merely mention to show that there must be a little water in the mixture, although in using ordinary æther and alcohol this might not be perceived. Before comparing collodion prepared with different iodides, it appeared probable that those of potassium and ammonium would produce greater sensitiveness than those of zinc and cadmium; for this reason, that the nitrates of ammonia and potash, which are produced together with iodide of silver, on immersing films prepared with the two first iodides in the nitrate bath, are perfectly neutral, while the nitrates of zinc and cadmium which result when collodions containing those metals are used, have a *feebly acid* reaction on litmus paper, and thus by their presence in the film, *might*, like weak acids, retard the action of light; in actual experiment, however, I did not find this to be the case, for when carefully and similarly prepared with equivalent quantities of each iodide, and used while colourless, the collodions appear similar in sensitiveness, gradation of tints, and all other respects. In a few days, however, they begin to differ in consequence of partial decomposition and liberation of free iodine, which occurs more readily with the iodides of ammonium and zinc than with potassium, while the iodide of cadmium, if I may conclude from one sample I have by me, remains *perfectly* colourless for any period of time, retaining its original sensitiveness, the other varieti having lost theirs in proportion to the colou they have acquired. The iodide of cadmium in addition to this valuable property of givin a stable collodion, is likewise extremely solubl without being deliquescent, and being beaut fully crystalline, is not liable to adulteration or impurities, and therefore well deserves to b generally tried. In order to preserve, or as is stated, to improve the sensitiveness of coll dion, some persons recommend the addition o a little ammonia; this, however, appears ver unadvisable, since it *necessitates* the use of a acid bath; and although it may render the coll dion less liable to change, it produces a con trary effect on the bath, since every plate im mersed tends to neutralize a portion of aci and at length rendering it neutral or even alk line, and brings about exactly the phenomen described by Mr. Fenton. With ordinary coll dion, however, even when quite colourless, t bath may always be used *perfectly* neutral, pe mitting the developing solution to be left twice or three times as long as is necessar without the slightest fogging, provided that t nitrate of silver is pure and the bath has n acquired fogging propensities by prolonged us No pure alkaline iodide can ever render t bath alkaline; the only effect on immersing plate covered with collodion is to remove portion of silver and substitute an equivale quantity of ammonium, potassium, &c., so th a portion of nitrate of silver is merely replac by a portion of nitrate of potash or ammon which, being neutral, cannot in this resp affect the state of the bath; with the iodi of the metals, such as iron, zinc, cadmium arsenic, the bath, on the contrary, will so become apparently acid from the presence the nitrates of those metals which, as bef stated, redden litmus. In all cases, excepti when free ammonia has been added to the col dion, the silver solution has a tendency become acid rather than alkaline, both fr the frequent presence of free iodine in the col dion, which sets free nitric acid in the ba and also from the slow formation of ac acid from the alcohol and æther washed from the plates that have been immersed. T effect of free iodine in the collodion is not h ever chemically the same as that of nitric a in the bath, for nitrate of silver is, like all ot nitrates, a nitrate of the oxide of silver; wl therefore, free iodine acts on the silver solu it liberates oxygen as well as nitric acid, result being that an *iodate* as well as an io of silver is formed; the effect of the for should therefore be ascertained in order to cle understand the action of brown collodion. W a great deal of iodine has been set free by l keeping, making the collodion very dark colou and insensitive, I found that the addition a little oil of cloves, in the proportion of four d to each ounce, causes a surprising increas sensitiveness, and some time ago I always u such a mixture for the production of posit on glass, from a belief that a better colour more perfect gradation of tints were obta in this way than by any other method. At

ne, however, my pictures were constantly ble to solarization (or darkening of those parts at ought to be whitish) when using the ordi-ry collodion and developing by pyrogallic d nitric acids; but lately, while seeking for ficulties in order to discover their causes, this ndency to solarization quite disappeared, though using the simplest materials; neither as I able to produce it by taking objects in the ost unfavourable conditions of light and shade, r by any addition to the collodion. Accident-ly trying the effect of a minute quantity of trite of silver in the nitrate bath, I obtained again in perfection, and was able at once to derstand how it occurred formerly, for at that ne I always made use of nitrate of silver that d been strongly fused, and in which a portion nitrite had thus been formed, while latterly ly the crystallized salt had been employed. he effect of oil of cloves and iodine in the col-dion was to counteract that of the nitrite, it when pure crystallized nitrate is used no ch additions are required. It is remarkable, wever, that although oil of cloves greatly creases the sensitiveness when brown collo-on is used, no such effect is produced by its dition to colourless collodion with an acid th, proving that free iodine in the former is t exactly similar to nitric acid in the latter. compensate for the bad effects of the nitrite the colour of positives, it has the important operty of much increasing the sensitiveness d rapidity of the surface, allowing pictures to taken instantaneously with far less light than usually required, and it is thus particularly ited to negatives, in which the colour by re-cted light is of no importance, while it adds the opacity of the dark parts of the picture. s effects on the colour of positives is chiefly en when pyrogallic acid is used for developing, d becomes more marked as the picture dries, hen the tint of the reduced silver becomes *irker* and of a greenish colour in the most posed parts, while with *pure* nitrate, as the oisture evaporates, it becomes *lighter*, and the tails appear more distinctly represented in rious shades of *one* colour. As this nitrite is rmed when the nitrate is overheated, it gene-lly exists in 'lunar caustic' to a greater or less tent; but as this substance, from a want of ystalline form, is easily and frequently adulte-ated, it is much better to add the nitrite to a lution of the crystallized nitrate in quantities ss than half a grain to an ounce of a thirty-ve grain solution, for too large an amount uses a fogging of the clear parts of the pic-ire. It is easily obtained by fusing pretty rongly a mixture of equal parts of nitre and trate of silver; the fused mass being dissolved a small quantity of boiling water and the lution left to cool; the nitrite of silver then ystallizes out in the shape of long, slender eedles, which may be removed, and pressed in lotting paper to dry them; by recrystallization ey are obtained quite pure. To this or some milar compound, Mr. Thomas appears to allude his paper on the silver bath, when he says at he has observed some peculiarities while sing a solution containing a *sub-oxide*, although e does not state what they are.

"To return, however, to the subject of collodion that has become discoloured by keeping, there is no mode of restoring its sensitiveness superior to that recommended by Mr. Crookes, by the addition to the collodion of *pure* metallic silver, which, by simply forming iodide of silver soluble in the remaining iodide, rapidly effects its decoloration without difficulty or uncertainty. This plan I adopted a long time ago, but soon afterwards abandoned from finding that collodion thus treated became opaque on drying, in consequence, as I imagined, of some action on the gun-cotton in solution; the real cause appears to have been that the silver used was not pure, being precipitated from the nitrate by metallic copper, and possibly containing a mixture of oxide, for I find that in collodion treated with silver prepared in this way, a portion of acetic æther is formed, a very little of which added to the best collodion is capable of destroying its tenacity and rendering it opaque on drying; with pure silver no such effect is produced, nor even with that precipitated by mixing solutions of nitrate of silver with sulphate of iron, which, though not quite pure, answers very well. Metallic iron was another substance that I tried, with the intention, not merely of restoring the original sensitiveness, but of increasing it by the formation of iodide of iron; instead of this it had the curious effect of bringing the collodion to a state of jelly, rendering it useless. Some persons, however, so far from wishing to decolorize collodion, add a quantity of iodine to it from the first, under the impression that it is necessary in order to protect the clear parts of the picture. With these I can fully sympathise, as I had the same idea at one time; for when the subject was first published in the *Chemist*, in 1851, no mention was made as to the time of exposure, and being accustomed to the paper process, I concluded the collodion film required the same length of time, and in consequence wholly failed in obtaining anything more than universal blackening of the surface. I therefore put the collodion by for a month or more, when finding it had become dark brown, it occurred to me to try it again, and I obtained an excellent result, using the same length of exposure; and by examination having ascertained that the colour was owing to free iodine, I used for a long while to add it in large quantity to fresh collodion. A great many substances were then tried for the purpose of increasing its sensitiveness, of which by far the most successful were the essential oils as before mentioned, which reduced the time of exposure from half a minute to five or ten seconds, and formed the most rapid process I knew, until to my great surprise the pure colourless collodion proved the most rapid of all; from this I conclude that many persons condemn a collodion as incapable of producing clear pictures, in consequence of exposing too long in the camera.

"That there are, however, other causes of fogging, cannot be doubted, some having excited considerable attention lately; but as Mr. Hardwich has entered into the subject at some length, I will only add my testimony to the fact that the nitrate of silver bath does, by continued use, acquire a tendency to fog, apparently from the presence of some organic matter, for on distilling off the water from a bath of this kind,

the distilled liquid used to dissolve fresh nitrate of silver gives some fogginess, while the nitrate remaining behind in the retort, evaporated at a *gentle* heat and redissolved, gave much more; a portion also strongly heated was found to give off carbonic acid, showing that the nitrate was contaminated with a portion of organic matter, though too small in quantity for its nature to be ascertained. I am, however, by no means sure that it is not owing to acetate of silver, of which a very little added to a *neutral* bath will cause complete blackening of a plate under the action of the developing fluid, even though it has not been exposed to light at all. For the mode of getting rid of the impurity, whatever it may be, I refer to Mr. Hardwich's paper.

"The strength of the solution of nitrate of silver ought to be proportional to the quantity of iodide in the collodion, at least so far that it cannot be *diminished* beyond a certain point (depending on the collodion used) without a great loss of sensitiveness, or, what is exactly similar, if we use a bath of a certain strength, the quantity of iodide cannot be *increased* to any amount, but must be limited by the proportion of nitrate of silver: with a thirty-five grain solution of the latter, four grains of iodide to the ounce of collodion answers very well; but if the quantity be increased to six grains, there is a great loss of sensitiveness and intensity, the effect being similar to that arising from an insufficient amount of alcohol in the collodion, in consequence of the iodide of silver being deposited superficially, or even falling off the surface into the silver bath. The mistake of over-iodizing the collodion is generally committed with the view to obtain greater opacity of the reduced silver, apparently from an idea that the iodide only is reduced, while in fact a large portion of the reduced silver is derived from the nitrate, so that a very little iodide in the film is sufficient to give intense negatives. For this purpose the collodion should be colourless, or nearly so, or at least, if coloured, it must not be owing to free iodine, (which is ascertained by allowing a drop to evaporate on a piece of starch or a crumb of bread, and then moistening with water; a trace of iodine is detected by the black colour resulting;) the bath should likewise be neutral, or nearly so, and the developing fluid should contain no more acetic or tartaric acid than is sufficient to prevent blackening of clear parts; after the pyrogallic solution has apparently done its utmost, the intensity may be further increased by pouring on a fresh portion, mixed with some of the silver solution, which immediately adds to the opacity of the negative, a fresh deposit taking place on the parts already reduced. By the use of the nitrite as before mentioned, still greater opacity may be obtained together with the utmost rapidity; at the same time there is none of that violent contrast of light and shade which appears to result from the addition of iodide of iron, as an accelerating agent, to the collodion. I believe that salts of iron have not as yet been used for developing negatives, in consequence of the want of opacity in the reduced parts. I find, however, that the proto-acetate of iron obtained by mixture of solution of acetate of lead and sulphate of iron, is capable of producing intense negatives, resemblin in all respects those obtained by pyrogallic aci while it has the advantage in point of econom but I have not as yet made a sufficient numb of experiments to enable me to determine t strength of the solution best suited to the pu pose; it need not be very great, somewhat le than eighteen grains to the ounce, for if it co tain so much as this, it is liable to produce un versal blackening when first prepared, but in few days, when a portion of peracetate has forme it answers very well. My object in endeavou ing to find a substitute for pyrogallic amon the iron compounds, is not to add to the nu ber of developing fluids and the perplexity of beginner, where pyrogallic acid can be obtain pure, and is found to answer perfectly, for that case it is preferable to anything else; b as this may not always be, it is useful som times to know of a substitute that can be pr pared wherever green vitriol and sugar of le can be found, for, even when impure, the substances are very easily purified by r crystallizing from a solution in boiling wate which is not the case with pyrogallic acid, which noxious ingredients might easily l added, accidentally or intentionally, from whi it would puzzle a chemist to free it.

"By knowing the quantity of iodide contain in a collodion, it is easy to ascertain the amou of silver that the bath loses for each ounce, a thus to know exactly how much nitrate shou be added to maintain the same strength; thu with a collodion containing four grains of iodi of ammonium to the ounce, each ounce e pended removes four and seven-tenths grains nitrate of silver, but with four grains of iodi of potassium the quantity of nitrate consum is only four and one-tenth grains. In t first case nitrate of ammonia, in the seco nitrate of potash, accumulates in similar p portions, but the ammonia salt has the adva tage of being easily dissipated on evaporati the bath and gently fusing, leaving only sal of silver behind, while the nitrate of potash quite fixed.

"In conclusion, I think we have much reas to congratulate ourselves on the great degr of perfection that photography has already tained, considering how very little we kn about the instantaneous change produced light, and of which we should have remain quite unconscious but for the wonderful d covery of the art of developing; and seeing h incapable we are of predicting beforehand t action of any material, we may consider o selves indebted to good fortune, as well as the perseverance of the discoverers, for success of many of the processes we now p sess; for although the first trial of a mate arises generally from some theory in the mi of the experimenter, the result very frequen differs entirely from his expectations: thus, the application of collodion as a substitute albumen by Mr. Archer, with the intention, he states, of obtaining a film equally trans rent, but more tough and elastic, the gr difference in sensitiveness between the t materials could never have been anticipat and is now difficult to account for, while t great sensibility of the materials used in t

›rmer process, in a state of purity, and which ›ems to be diminished by almost every addi- ›on, cannot fail to surprise and gratify any one ›ho has experimented much on the subject. ›ith regard to rapidity and sharpness of defi- ›ition, thanks to the invaluable assistance of ›e makers of lenses, the process seems almost › have reached perfection; the points to which ›tention should be now principally directed ›pear to be an addition to, or substitute for, ›e iodide of silver, giving a surface equally ›nsitive to all colours; and likewise so›e ›eans of developing positives which shall com- ›ne perfect whiteness and delicacy of shading ›ith entire freedom from metallic appearance › reflected light, which alone is wanting to ›ake them surpass Daguerreotypes."

›ATENT FOR THE ORNAMENTATION OF METALS, AND FOR PRINTING BY PHOTOGRAPHY.

›ROM the last number of the *Repertory of Patent ›ventions*, we learn, that Dr. Cheetham, of Roch- ›le, has a patent for "Improvements in the ›pplication of Photographic Pictures to metal ›d other surfaces, and in rendering the same ›pplicable as Printing Surfaces." The inven- ›on relates, firstly, to obtaining designs upon ›pper and other metallic surfaces, so as to con- ›itute pictures, which may so remain for orna- ›ental or other purposes, or upon which the ›graver may work by any of the usual methods. ›e principle proceeded upon is to obtain a ›otograph by any ordinary means, and then › transfer the reduced silver or other substance ›mposing it, to the copper or other such sur- ›e, in such manner that it shall be free from ›e film which supported it, and in direct con- ›ct with the metal.

The method adopted is this:—In the first ›ace obtain a collodion photograph, and while ›is is wet upon the plate apply to it, by pour- ›g or otherwise, a varnish composed of shellac ›ssolved in water by the aid of borax, say one ›rt of borax, three of shellac, and ten of water, ›t the exact proportions are not important; ›hen this is dry, a piece of paper painted with ›e same materials is applied wet, and the whole ›lowed to dry, after which the plate is placed › cold water, and the film will then separate ›m the glass. Now take a sheet of copper or ›her metal and coat it with mercury, after any › the usual methods, and upon this place the ›m; pressure being then applied simply by ›bbing or by an ordinary press, the silver con- ›ituting the picture will adhere to the mercury, ›d upon a gentle heat (the amount of which ›ill easily be ascertained by practice) being ›plied the film will be separated therefrom, ›ving it perfect upon a metallic surface. The ›cture thus transferred may be used as a trac- ›g for the guidance of the engraver, or it may ›nstitute a permanent design upon ornamental › other metallic articles. Copper is particu- ›rly alluded to, but zinc, silver, steel or other ›aterials may be employed, and these may be ›st coated with copper by electro-metallurgy, ›en treated as above, and those parts of the ›pper not covered by the picture subsequently ›moved by acids or by other means. As a ›riation, the film with its picture may be removed from the glass by the use of a solution of gutta-percha in benzole, as now practised, and applied to the mercurialized metallic surface; but in this case the film must be removed by dissolving it in methylated [spirit] chloroform or other solvent, and the mercury may then be driven off by heat if desired. It will be observed that the picture is not caused to adhere to the metallic surface by any glutinous substance such as gum or varnish, but is connected therewith by the mercury, after the ordinary manner of gilding.

Another part of the invention consists in a method of obtaining, by means of photographs, surfaces for printing from. For this purpose proceed according to the first part of the invention as above described, so as to obtain the silver picture upon a surface of copper or other metal, and then treat the plate with an agent, such as nitric acid, which will eat away one portion of the surface and leave the other in relief.

Another part of the invention relates to obtaining printing surfaces upon the lithographic principle. To effect this the stone is rendered a conductor of electricity by a coating of phosphorus or other suitable substance, and a film of copper or other metal is deposited thereon; upon this the photographic design is transferred and the bare copper or other metal is dissolved away; the stone which was beneath this is then run over with the inked roller, and the metal picture subsequently removed, leaving a clear surface of stone for the light portions; or this operation may be reversed.

PRESSURE FRAME FOR POSITIVE PRINTING.

By M. Belloc.

We have not yet had an opportunity of working with M. Belloc's patented printing-frame, but we do not the less hesitate to direct our readers' attention to the annexed drawings and description of it. We know enough of M. Belloc's zealous labours and painstaking character to warrant us in anticipating that his contrivance will be found to answer fully the description he gives of it.

This frame is characterized,—

1. By immediate, constant, and regular contact between the negative plate and the paper on which the positive is to be taken.

2. By a peculiar disposition of moveable shutters which admit of the most ready and easy manipulation. The invention is represented in the accompanying designs. Fig. 1 is a longitudinal section of the apparatus closed, and also showing the opening of the shutters: this section is taken along the line $x\,x$ in fig. 3. Fig. 2 is a side view, showing the way of closing the moveable shutters. Fig. 3 is a plan of it shut.

The same letters show the same parts in the three figures. A is the frame: it may be made in wood or in any metal.

B is the large glass, on which the negative is placed. This glass rests on a frame of cork, *b b*, or on any other material not elastic or distending, to preserve an unvarying flatness and prevent fracture.

C C are the two shutters; they open on each side by hinges, which may be placed on the long or broad sides of the frames; in the former

case the shutters open lengthways instead of breadthways. This, be it observed, makes no change in the principle of my apparatus.

These shutters can also be made of equal or unequal dimensions, so that the opening may be in any part of the frame, according as it is desired to look at the half or three-quarters of the picture.

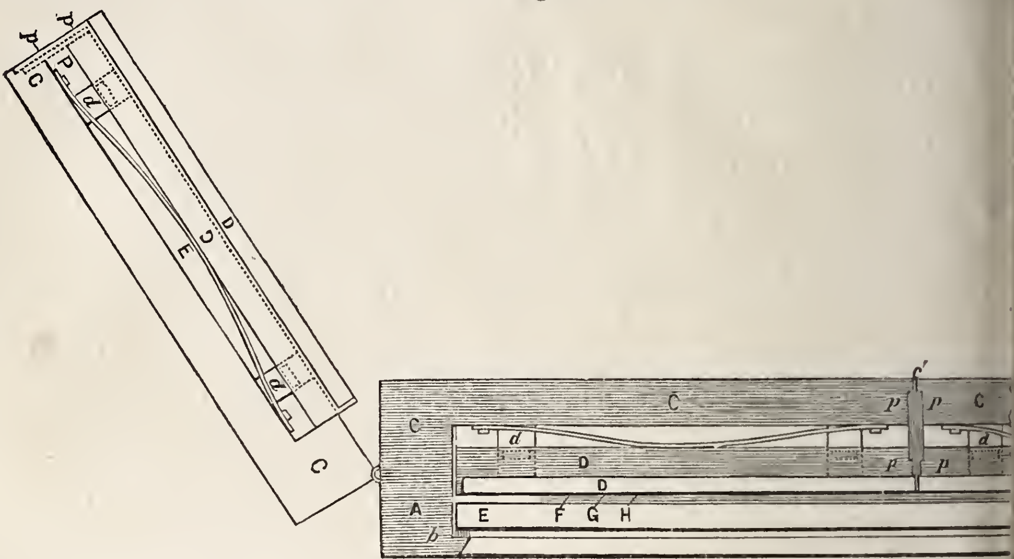
D D are two plates of glass (which may be also of marble or metal, or any other hard substance), fixed in a wooden or metal frame, D′; this frame works in four grooves, *d d d′ d′* connected with the shutter C. It is separated from this shutter by springs, E E. These springs are of any shape and of any elastic material ; they may even be formed of an ai cushion, enclosed in a cover of caoutchouc, o anything else, which must be placed betwee the glasses D D, and the shutter C in whic they slide.

These glasses are bevelled off along the edg which come into contact, so that they may n chip when they meet in the act of closing.

These same glasses can also be framed, t avoid the friction and thus obtain the same resul

The part P is closed by means of two board *p p′*, one fixed to the frame C, and the other t the frame D, and they slip one into the othe in order to prevent the pressure from pen- trating into the part P.

Fig. 1.



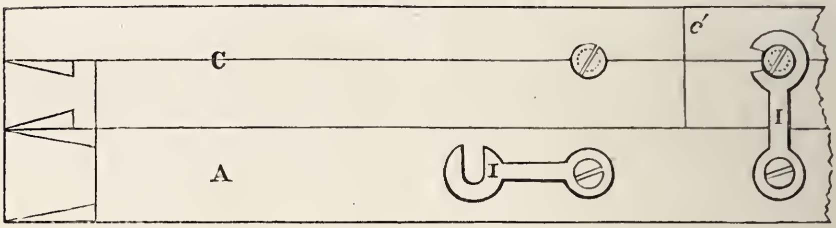


Fig. 2

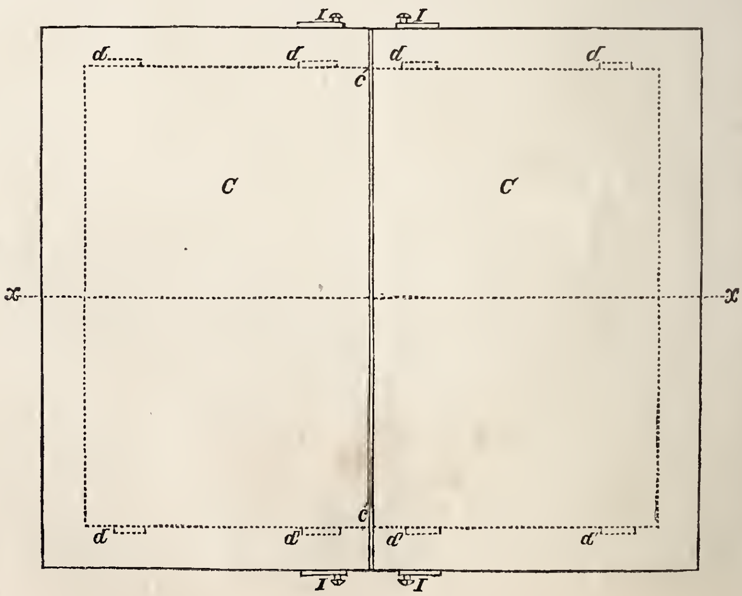


Fig. 3.

F F. The Negative.

G. The paper for the production of the ɔsitive proof.

H. Paper intended to cover over the positive ıper, and to support a sheet of vulcanized ıdia-rubber, so that the pressure may be more ıual.

IIII. Hooks for fastening the shutters C C ɔ the frame. They may be replaced by latches, : any other kind of fastenings.

The workings of the apparatus may now be ıderstood. The negative and papers are placed ı shown in Fig. 1; the two shutters are closed, ressed down, and fastened by means of the books II; the frame is then exposed to the light.

The advantages which result from the use of ıis pressure frame are, the giving a very great ıarpness to the proof by close contact; the voiding the breaking of the glasses of the frame : of the negative, as is apt to be the case with ıe common apparatus; the avoiding any posble scratching of the collodion, &c., in putting ɔwn or lifting up the double glasses; the allowıg a view of a part of the print by opening a ngle shutter, without in the least displacing ıe two proofs, negative or positive; lastly, cility and rapidity of execution, by doing vay with the lifting of two double glasses.

VARNISH FOR COLLODION NEGATIVES.

By M. Boivin.

HE collodion surface being easily scratched, ıme means must necessarily be adopted to prerve it from accident. To this end many subances have been proposed, but not with a due ınsideration of the qualities required. A varsh for our purpose should be—1st, So fluid as ıt to give too much translucency to the negave, or we lose vigour, and yet it must be thick ıough to preserve effectually the film. 2nd, It ıould be hard enough to bear reiterated rubng. 3rd, It must soften at a moderate temırature. Copal varnish, diluted with benzole, ıs been commonly employed; it spreads so ısily that almost everyone has adopted it. But ɔw many negatives have been spoiled by its sinification after a certain time, and by its ıftening in the sun during the printing proıss, causing the adhesion of the paper to the ıgative! Knowing these difficulties to exist, . Boivin communicated to the French Society s mode of procedure, not as claiming to have ade a discovery, but simply to furnish an improvement on the every day practice.

Into 100 grammes of ordinary alcohol pour ght or ten parts of oil of lavender, add to this ve or six grammes of gum lac; dissolve in a water ıth and filter. In a well stoppered bottle place ve grammes of powdered amber, mixed with oken glass to divide it, and thirty grammes of ıloroform; leave the mixture to digest for veral days, shaking it occasionally. Then at ngth take one part of this liquid and two parts the lac solution, mix them, let them incorpote, and then filter. Your varnish is made. In der to coat the film, slightly warm the glass a spirit lamp or by the fire; when it has ached a temperature which is not unpleasant the hand, pour on rapidly the varnish, beginıng at one of the upper corners, drain off the ccess into a bottle, and place the plate in a vertical position to dry. Then heat again to obtain lustre, and all is accomplished.

To recapitulate, its advantages are,

1st.—It perfectly protects the film without increasing, sensibly, its thickness.

2nd.—It does not soften in the sun, and does not diminish the vigour of the image.

3rd.—It so protects the surface that the negatives may be kept in a portfolio, or a box without grooves.

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—I have just read in the *Photographic Notes*, of August 1st, a letter signed "R. E.," which—notwithstanding its impertinence—I do not think I should allow to pass unnoticed.

It is occasionally a work of great difficulty to convince some individuals of a truth that is at once, with the greatest ease, apprehended by others.

"R. E.," after stating that he had expected "some experienced photographer would give his opinion upon Mr. K.'s claim," proceeds to quote from my paper, which has apparently afforded him severe mental exercise. He concludes his first extract thus: "'The remainder of my process is so widely different from the usual theory of positive pictures, that I have no doubt it will excite some surprise.'"

I should like to know what was to excite surprise? The differences between the processes, of course. That practised by *me* on the one hand, and those practised by *others* according to the usual theory. "R. E." further remarks, "'Mr. Keith alluding to Mr. Hardwich, says, 'But mine is the very reverse.'"

Mr. Hardwich recommends,	*I recommend,*
1. Thin and lightly iodized collodion.	1. Thick and fully iodized collodion.
2. Twenty grain nitrate bath faintly acid.	2. Forty grain nitrate bath, very acid.
3. Proto-sulphate of Iron.	3. Proto-nitrate of iron with nitric acid.
4. Weak cyanide.	4. Strong cyanide with the addition of nitrate of silver.

It surely does not require any extraordinary intellectual effort to discover sufficient difference between these two processes to warrant me in saying, "mine is the very reverse."

He further asks, "What does Mr. K. claim?" I answer him, nothing. I was merely describing, for the benefit of the Liverpool Photographic Society and others, a process by practising which carefully you would "scarcely see one in a hundred of positive portraits that was *not* presentable." I never dreamt of disputing the claim of Professor Hunt to the discovery of the use of proto-sulphate of iron, or Dr. Diamond to the proto-nitrate.

I shall now notice what is said respecting me in giving the concluding extract from my paper, "It is singular that two individuals, without any communication, should *hit upon* formulæ so near alike and yet so *different from any before published.*" "What does this last sentence mean?"

I will tell him. It means that I had never seen or heard of M. Martin's formulæ, consequently his inference that I "must have taken it from *La Lumiere*, or some other work," is illogical, presumptuous, and incorrect. It means that I had reason to suppose that Mr. Sutton had in some way possessed himself of my formulæ.

I shall now bring forward the materials furnished by Mr. Sutton in support of this belief. In *Photographic Notes*, No. 19, page 29, Mr. Sutton speaks of the developer as "my developer." In the number

of August 1st, speaking of me he says, "He has lost credit by allowing me to publish it before him, and then getting out of temper about it." *I have not* lost credit by allowing him to publish my formulæ before me, but I think *he has* lost credit by publishing it without having the candour to say whence he derived it. He now states, "I am indebted for this developer to Mr. J. Worden, of Hull, who arrived at it by an *independent course of experiments.*"

The Mr. J. Worden named by Mr. Sutton, after leaving Hull, practised for some time as a photographer in Newcastle. Some time previously I had furnished Mr. Mawson, of Newcastle, with my formulæ, which were by him published and extensively circulated while Mr. Worden was practising there. I now leave your readers to judge whether I had sufficient grounds for *supposing* that my formulæ had been adopted by Mr. Sutton.

I may remark, before quitting the subject, that I do not agree with "R. E." that agitating the subject in his manner is at all likely to advance photography, and in conclusion I may say to Mr. Sutton, that I have not lost my temper, on the contrary, I trust I have treated the matter throughout as one of "pleasantry."—I am, Sir, your obedient servant,

34, *Castle-street, Liverpool,* WM. KEITH.
24th August, 1857.

ANSWERS TO CORRESPONDENTS.

Mr. Wm. Ross will kindly excuse our not having yet made use of his communication. It shall be attended to in our next.

P.Y.G.—The collodio-albumen negatives arrived unbroken. They are good specimens. No. 2 is very good. The great point seems to be to hit the right time of exposure, and then to avoid too much silver in the developer.

J.—The positives from collodio-albumen negatives show that you are in the right path, but we think longer exposure in the camera would have been better. Again, much depends on watching the development, so as to stop before the details in the high lights are obliterated. Your pictures resemble those made by P.Y.G.; see the answer to him.

"Lilly White" requests that we will return his communication, since we have not inserted it. We reply, that we cannot undertake to return rejected communications; but, as we do not wish further to offend, we will take the first opportunity to see if it be still in existence. "Lilly White" is unjust, and evidently ignorant of journalism. He got us to answer certain questions, and he then sent precisely the same questions to the *Journal of the Photographic Society of London*, the editor of which at once referred him back to the *Liverpool and Manchester Photographic Journal* for his answer. Since that he has gone off to *Photographic Notes*. We have, it seems, offended him because we have not *published* his advice to us respecting our mode of conducting the *Journal*. His letter might *amuse* some of our readers, but it would give them no information they do not at present possess. Finally, if we are to be advised by our correspondent, a different tone must be adopted.

X.—In some experiments, made lately, we ascertained that an acid bath which gave a rotten film was set right by neutralising the free nitric acid by carbonate of soda. Having done this, we purposely added fresh nitric acid, when the film again split off from the glass. On finally adjusting the bath till *faintly* acid the film bore rough washing without injury.

Dr. Hanlon's communication in our next.

Exhibition of Art Treasures at Manchester.—Although in type, the article on this subject in continuation of former notices, has been reluctantly omitted, through want of space.

CONTENTS. PA[GE]

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One of the great advantages of this Collodion is, that, when *iodized* it will retain all its qualities for *many months*, thereby enabling small consumers to effect a great saving as it may safely be purchased in large quantities at the reduced price of 9s. per pound.

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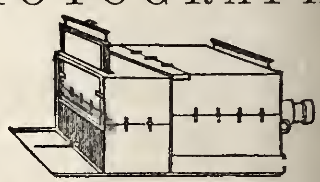

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

[New Series.] No. 18.—SEPTEMBER 15, 1857. [Price 3d. Stamped 4d.

LIVERPOOL: Printed and Published by the Proprietor, HENRY GREENWOOD, 32, Castle Street.

[LO]NDON: HORNE & THORNTHWAITE, 123, Newgate-street; H. BAILLIERE, 219, Regent-street. MANCHESTER: J. B. [BARK]ER, 43, Cross-street; J. J. PYNE, 63, Piccadilly. BIRMINGHAM: PERSHOUSE, JOHNSON & MORRIS, 28, Summer-row. [DUB]LIN: J. ROBINSON, 65, Grafton-street. BELFAST: GRATTAN & CO., 10 & 12, Corn Market. EDINBURGH: JAMES WOOD, [88, P]rinces-street GLASGOW: WILLIAM LOVE, 30, St. Enoch-square; JOHN SPENCER, 16, Saltmarket.

The
[L]iverpool & Manchester Photographic Journal.

New Series. No. 18.—SEPTEMBER 15, 1857.

[PHOT]OGRAPHERS begin to be overwhelmed by [pam]phlets on the dry collodion process, and yet [we c]annot say that Mr. Barnes has performed a [work] of supererogation in adding to the number, [by p]ublishing a new edition of his work of last [year,]* "carefully revised and augmented." Mr. [Barn]es sets out by complaining that Mr. Hard[wich] has given to Dr. Hill Norris the credit [whic]h is due to another, Mr. Barnes having, [as h]e says, published in May, 1856, what was [rega]rded as "a discovery" some months after[ward]s—in November of the same year. More[over,] Mr. Barnes says that he has carried his [expe]riments so far, that the aforesaid discovery [is no] longer of importance, he "obtaining results [with] *new* collodion with much greater rapidity [and f]acility than by the use of *old*." Mr. Barnes' [expe]riments have the merit that they were per[form]ed upon large plates, 10 in. by 12 in.; and, as [a pro]of of their successfulness, he is willing to [exhib]it all the negatives that he has taken, and [give] any explanations, if the Photographic So[ciety] will only appoint an evening, and exhibit, [side-]by-side, pictures taken by each of the dry [meth]ods published up to the latest date. We [hope] this challenge will not be allowed to pass [unhe]eded. In the first edition Mr. Barnes recom[mend]ed collodion unsupported by any other [subst]ance, but he is now convinced that it is [bette]r to use albumen as a substratum. Among [other] advantages we have this great one, that [alm]ost any collodion—Thomas' especially, for [insta]nce—can be easily rendered fit for dry [plate]s." For those who prefer to prepare [their] own, there is a formula for the collodion [give]n, which to us is very complex. It con[tains] gold and pyro-acetic spirit, or wood [naphth]a, as ingredients. The gold is said to give [intensi]ty to the picture, without injuring its de[licacy.] Camphor is also recommended as giving [intensi]ty, and causing the plates to be more [readil]y sensitive, and to develop more cleanly [than] usual. The time of exposure with a three-[inch s]ingle combination lens, by Lerebours, using [a ha]lf-inch diaphragm, is from two to ten minutes. [In d]eciding upon the length of exposure the [high] lights are not to be taken into considera[tion,] "the sole guide being the middle tints of [the p]icture." The plates do not appear to lose [their] sensibility, for some which had been kept [for w]*eeks* were quite as sensitive as those re[centl]y prepared. We are glad to be able to [give] prominence in these pages to Mr. Barnes' [work], because he is so thoroughly in earnest in [his e]ndeavours to leave the reader *fully informed* [upon] every part of his method.

* "The Dry Collodion Process," by Robert Freeman Barnes—[...]s & Co., New Bond Street.

Those who are interested in the bichromate of potash and gelatine processes will peruse with interest Mr. Talbot's account of his engraving experiments. Herr Pretsch had, it seems, the raised image and its peculiar molecular surface prepared for him by Mr. Talbot's labours. How are we to ascertain the degree of merit that belongs to each investigator in cases like the present?

Our readers and we ourselves have to-day to thank our correspondent "Σ" for his final communication upon the Manchester Art Treasures' Exhibition, as well as for a notice of the Dublin Meeting of the British Association. With regard to the former topic we may as well now state that we visited Manchester in June last. We have, therefore, had an opportunity of testing (unknown to our correspondent) his judicious statements, by our own impressions. We agree so fully in our views regarding the collection, considered as a whole, as well as in detail, that we have no need to remark at any length upon the subject. Our correspondent has been rather lenient in pointing out the short-comings of the project. We were thoroughly disappointed. We had just seen the French Photographic Exhibition, which was rich in the very points that the Manchester collection was deficient in.

It must be admitted, that photography, as a whole, was at Manchester but very indifferently represented; yet, at the same time, it cannot be denied but that the art was also shabbily treated by those who had its interests committed to their charge. In saying this we know that we have the Manchester *photographers* with us: the fault is not with them.

We have not space enough left to do more at present than to announce the reception of a report of the *Architectural Photographic Association*, which has been forwarded to us by Mr. Ellison, the Honorary Secretary to the Branch Association now formed at Liverpool.

Liverpool Photographic Society. — The first meeting of the session will be held at the Royal Institution, on Tuesday evening, the 22nd instant, when the vice-president will read an address, which will be followed by several papers upon important branches of photography. There will be a very choice selection of pictures by the first masters, and Mr. Newcombe's collodion knapsack will be shewn and explained. The members are particularly requested to furnish the Secretary with copies of their productions (with the *modus operandi*) for insertion in the Society's photographic chronicle.

EXHIBITION OF ART TREASURES AT MANCHESTER.

Our readers who may have followed us in our remarks upon the photographic collection of this Exhibition will, perhaps, wish to hear what our opinion is as to the results likely to accrue to the art therefrom; and though we have considerable diffidence in offering an unfavourable opinion of any portion of the very unique and invaluable collection at all, yet of *this* portion we can only come to one conclusion, which is decidedly unfavourable; and the only advantage that we can see is that it may be seen from it, as from all similar exhibitions, in what direction our efforts may and ought to be directed, but we are not shewn in a distinct manner what has really been achieved, nor the manner of its attainment;—the public are left entirely in the dark as to the nature of the processes used, and the more advanced student is in this department left entirely to his own resources. We cannot think our Manchester friends—zealous as they have been for the complete exposition of the art of painting,—have been sufficiently desirous of fostering its willing and able handmaid, photography. It was said, "The space that can be appropriated will not admit of more than a thousand pictures; it will therefore be necessary to exclude all that are not of first-rate merit." But it seems to have entirely escaped the directors' attention that photography has any history at all, and accordingly it is a tale untold. The photographs here are all of the present day, and are contributed by but a few; they are not classified either as regards chronology or process, nor even in the manner in which we have so inadequately treated the subject. Then the collection is divided in such a way that a visitor who has seen but one moiety may reasonably conclude he has seen the entire. One only of the objects of the committee seems to have been effectually carried out, and that only in extent, but not in excellence. "The committee suggest that as complete a series as possible of portraits of eminent men should be included in the collection." A large series is the result of this application; but how many can be said to be first-rate? We are willing to concede that the committee have had higher and more elaborate aims; but they might surely have succeeded in getting their thousand pictures, and those, too, *all* of first-rate excellence, and such as would have amply illustrated the history of photography. More of photographic progress may be seen in our shop windows than here. The day will, however, come when the art shall be more generally understood, and a collection of photographs shall be better appreciated than now,—the very motives, invention, and execution of painters are criticized,—the materials they use are pretty well known; and, after this exhibition, (such as never was seen before,) we shall have able *cognoscenti* of the humblest classes ready to declaim upon the comparative merits of all the painters, from Cimabue and Giotto downwards. Why should not photography be made to contribute its quota to the general knowledge? Its progress, processes, and products might, we think, have been much more efficiently displayed; now we have only to thank the directors for showing us together what we might have seen at respectable society's exhibition, and for so in a manner which we think has beer celled. Still we have derived some pleasu this department; there are many works w we have named worthy of the utmost pı and many which give evidence of a pı worthy, painstaking labour. And now we take leave of the Exhibition, hoping that it not be long before photography has its This depends much on photographers t selves. Let them bestir themselves. Th a fine wide field open for them, and enough for all.

POSITIVE PROCESS.

By M. H. Bayard.

I prepare paper so sensitive that negatives be copied in one second in the sunshine, an process is such that it may bo used even artificial light. It may also be used to ol negatives in the camera-obscura, but mus employed *dry*.

FIRST PREPARATION.

Dissolve, in about two pints of distilled w

Iodide of potassium..	7	gram
Bromide of potassium............	2	„
Pure Sal Ammoniac	2	„
Cyanide of potassium...	1	„

Immerse the paper, sheet by sheet, for a qu of an hour at least, till thoroughly saturated, hang it up to dry. When dry the paper is ke a portfolio ready for use. The proportions o salts may be varied, provided always that iodide of potassium predominates; the pr ration of salts may be even dispensed (especially if Whatman's English paper be u and the paper at once submitted to the vapours, presently to be described; but the result is less sensitive to the light.

SECOND PREPARATION.

Add ten or twelve grammes of iodine to grammes of pure hydrochloric acid, and tw hours afterwards, having meanwhile freque shaken the mixture, to aid the solution of iodine, add seventy-five grammes of dist water. When the liquid is cool, pour son it into a dish, having a ground edge, and c it by a ground-glass cover; then take a s of the previously prepared paper, taking that it is larger than the dish, and slip it u the glass cover, and leave it exposed to the vapours for four or five minutes, accordin the thickness of the paper and the temperat then withdraw the sheet, shaking off the cess of vapour in the air, and place it up bath of nitrate of silver (nitrate of silver part to twelve parts of water.) In five o minutes after the exposure to this bath, all colour having disappeared, remove the p and hang it up by a corner to dry; the p must be thoroughly dried, and then it prese its sensitiveness for several days. Expose the focus of Daguerre's normal object-gla gives an image, in sunshine, in five minu by superposition the images are obtained, a have seen, in a second, or in an hour's expo to a carcel lamp. The images are made vi by gallic acid, and finished in the ordinary and fixed by hyposulphite of soda.—*Co rendus de l'Académie des Sciences.*

BRITISH ASSOCIATION
R THE ADVANCEMENT OF SCIENCE.

; distinguished Society has just held its ıty-seventh meeting in the city of Dublin, ›r the auspices of the Lord Lieutenant, to se cordial interest the meeting owed much ts success. At a meeting of the general mittee on the 1st instant, it was decided to the next meeting at Leeds, whose only petitor was Manchester; but notwithstand- some sort of a pledge which it was under- d had been given last year in favour of the r city, a very large majority decided for the er one. Manchester was represented at the ting by Mr. Alderman Shuttleworth, Thomas on, Esq., M.D., E. W. Binney, Esq., F.R.S., and William Fairbairn, Esq., C.E., F.R.S., '. Joule, Esq., F.R.S., &c., two of the Vice- idents, and Mr. Samuel Cottam, Honorary etary of the Manchester Photographic So- 7. During the meeting the degree of LL.D. conferred by the University upon Mr. Joule. section B (that devoted to chemical science) papers were read of general interest to ographers: among which we may name Apjohn, on some compounds of cyanogen; M. L'Abbé Moigno presented some micro- ic photographs of great beauty by M. sch, and some very fine copies of oil paint- by Mr. Bingham, among which, "La de la Malakoff" was one of the best; and Abbé also made some remarks on a new iod by M. N. de St. Victor, of exhibiting, ieans of photography, the phosphorescence fluorescence of bodies. We are unable to our readers an abstract of these papers, on account of the language in which M. bé so eloquently discoursed, but because he ıot favour his audience with any manipula- details. A conversation arose therefrom 1 the action of sulphate of quinine and other es, and Dr. Gladstone remarked that the overies alluded to would tend to elucidate of the more abstract properties of light, icularly the unsolved question as to what me of light after its absorption by objects ck by it.

r. Sykes offered some remarks on the pre- ation of collodio-albumen plates, which he osed to effect by the addition of a film of a-gelatine; he also asserted the right of land to priority in the discovery of photo- hy, in contradiction of the Abbé Moigno's n for France. Dr. Daubeny also exhibited imens of paper converted into parchment he means of sulphuric acid.

mong other interesting soirees and conver- ones, was one held in the house of the Royal lin Society and the Mansion House joined ther by spacious marquees in the grounds he former. A series of water-colour draw- of the Round Towers of Ireland excited h interest; and Messrs. Yeats and Son tributed a number of stereoscopes, with vs in Ireland, Egypt, &c. Messrs. Robinson sent microscopes, with numerous objects, ng which we noticed Mr. Dancer's micro- ic photographs. On the table were photo- phs by Bewley and Evans, of Dublin, of ıntic soundings, shewing delicate shells and infusoria. There were on the walls two very large paper portraits by Robinson, of Grafton-street, very good in their way, but shewing evident marks of the artist's pencil. In a spacious room in the Mansion House was a large collection of photographs of Rangoon, Amerapoora, Tsagain, Myo, and other places of interest in the Burman empire. All these, and numerous valuable articles of Irish antiquity and natural history, afforded ample subjects for discussion by the numerous and brilliant assemblage present. An exhibition of photographs was announced by the Photographic Society, but we believe was not held, owing to the small number of contributions. We saw some very good specimens of portrait photography in Dublin, particularly vignetted portraits, or as they call them there, halotypes. Photographers have every advantage in Ireland that they can desire—fine atmosphere, endless variety of subjects, and very convenient means of reaching them; and we are rather surprised that amateurs do not more abound, and that we see so few of their works here. Altogether, the British Association have every reason to regard their visit to Dublin as highly satisfactory; and we wish them every success at Leeds, where Professor Owen is to preside; and at Aberdeen in 1859, where the Prince Consort, it is hoped, will fill the presidential chair. Σ.

ON THE PREPARATION OF PYROXYLINE FOR COLLODION.

By T. F. Hardwich, Esq.

The following is an abstract of Mr. Hardwich's interesting paper as given in the last number of the London Society's Photographic Journal. That differences as to the result might be expected from the employment of the different forms of *cellulose* which are at our command, was a thing always to be anticipated, at least so we have been in the habit of thinking; and Mr. Berry stated nearly two years ago* that having succeeded in the manufacture of collodion with paper, he turned his attention to the best *flax lint*, with which he prepared pyroxyline completely soluble, yielding a collodion film which exhibited no striæ or opacity when magnified ten diameters. The resulting film was hard, and required no varnishing to fit it for copying. The nitric acid used was of great strength, and the time of maceration in the mixed acid varied from one hour to three. The soluble lint was totally unaltered in appearance and texture. Notwithstanding these facts, Mr. Hardwich deserves our best thanks for the complete manner in which he has pursued this subject.

"It is the general opinion," says Mr. Hardwich, "of those who prepare large quantities of collodion that filtering-paper makes better pyroxyline than cotton wool, and Swedish paper has been recommended as a uniform and suitable material." Experience, however, has shown that no kind of paper can be depended on, and that sheets taken from the same ream will often vary. This is shewn in the following way:—usually, on placing the strips of paper in the nitro-sulphuric acid, the temperature

* *Liverpool Photographic Journal*, Vol. II, No. 22, p. 131.

slowly sinks some five or ten degrees; but often it rises to a corresponding or greater amount. The resulting pyroxyline always differs in the two cases, and even more so than can be explained by the simple variation in temperature. With one particular sample of paper made from the best quality of rags carefully bleached, it was found that the temperature of the acid mixture rose so rapidly after a few hundred grains had been immersed, that red fumes were evolved, and the greater part dissolved with a hissing noise. Fragments of the pyroxyline were picked out of the acid and washed; these yielded a collodion which was remarkably fluid, and which stuck tight to the glass. The nitro-sulphuric acid was of known strength, and the mixture was brought to the formula recommended by Mr. Hadow. It therefore became evident that the published information was insufficient. A thorough investigation was now commenced. Specimens of cellulose in its varied forms were collected and compared. Cotton-wool, flax, dried pith, calico, linen, old rags, straw-paper, &c., were made into pyroxyline, and an equal weight of each dissolved in iodized ether and alcohol. All the pyroxyline was made in the same acid, and at one temperature. Some flowed with difficulty and speedily set in crapy lines, whilst others were almost as limpid as water. The structure in one case was tough and coherent, in another loose and powdery. The material which appeared to supply every requisite for negative collodion in the most perfect manner was old cambric. Next to that, although differing in some respects, new and fine linen, such as is used for shirt fronts: the film on the glass in each case was very smooth and even. *Flax gave a result altogether different*, the collodion being thick and glutinous, agreeing more or less with that obtained from *cotton*. A general inference to be drawn was, that the bleaching and purification of the raw material altered the nature of the fibre, and that the alkalies probably had something to do with the result. Portions of flax and fine linen were now boiled for some hours in a dilute solution of potash, and after washing converted into pyroxyline: the collodion afterwards obtained was found to be *unusually fluid and structureless*. Alkalies having a marked action, the effect of the sulphuric acid, as used in the parchmentization of paper was next tried, previously to the immersion in nitrosulphuric acid, and, as had been anticipated, the resulting pyroxyline dissolved largely in æther without producing glutinosity, and the resulting collodion film was *short and adherent*. From Mr. Hadow's experiments it seemed likely that sulphuric acid with a certain quantity of water might be added to the nitro-sulphuric acid, with the view of omitting the parchmentization process; and it is so, but the tendency of the cotton to dissolve in such a mixture is a disadvantage when working on a large scale. It is, however, a fact that pyroxyline so made is shorter in texture, and produces a more fluid collodion than the ordinary kind. *The rule of thumb mode of mixing together oil of vitriol and nitric acid is not therefore sufficiently certain.* A soluble pyroxyline may be so made, but the collodion will vary in contractility and general properties, according as the dil- sulphuric acid is present in greater or less quan-

The anomalies complained of in the use paper for preparing pyroxyline are, to a gr extent, explained by the above facts. T paper may contain both cotton and linen fi and these may be new or old, and more or l cleansed by alkalies; and all these points w make a difference. Linen, previously boi with potash, shewed, like many samples paper, a tendency to dissolve in the nitro-s phuric acid; and with old calico rags, nea rotten by use, the same thing was observal The pyroxyline made from the modified fi seldom dissolves entirely in ether, but the sulting collodion is of the kind described by Norris as suitable for the dry processes, viz very limpid in proportion to the number grains used, and it deposits a pulverulent s stance on the addition of water. It is imp tant to observe that the strength of the nit sulphuric acid may be increased to a considera extent, when dealing with the modified fi without affecting the solubility of the pyro line in ether. With one sample of paper, wh resembled cotton in its reactions, a very sli diminution of the amount of water in the mula caused the product to be insoluble, wh the same paper previously parchmentized g a pyroxyline that dissolved partially in et even though the water had been entir omitted from the nitro-sulphuric acid; wh in this case, was prepared by mixing e bulks of oil of vitriol and nitric acid, the la being of 1.45 sp. gr. The formula $HO N$ $2 HO SO^3 + 3\frac{1}{2} HO$, established as the best making soluble pyroxyline, may, therefore some cases be departed from with impunity.

M. BAYARD'S PROCESS FOR TRANSFERRING COLLODION TO PAP

In our report of the last meeting of the Fr Photographic Society allusion was made t Bayard's transferring process, of which we give an account, together with some fu remarks by Baron Gros on the same subject

Make a solution containing about four cent. of gelatine, and pour it, while warm, a warm dish. Float Canson's thin nega paper upon this bath for about two minute until the paper has become quite flat upon liquid, then remove the sheet, and suspen by one of its corners to dry. The paper prepared may be kept good for some time.

To remove the collodion film, or the nega image, plunge the plate, either moist or into a flat dish of water. Then take a she the gelatined paper, of the size of the glass float it upon the water which covers the lodion plate; then, as soon as the paper become quite flat, or in about three min time, lift up the plate in such a manner that floating sheet shall be removed, leaving latter in perfect contact with the collodion Now drain away the water as completel possible, and leave the whole on a level to dry.

In place of immersing the plate, water ma poured upon its surface, and the gelatined p previously moistened on a separate bat

en floated on, and the water allowed to run vay from between the gelatine and collodion rfaces by simply inclining the plate. It is a iestion whether the plate will be best dried by acing it horizontally or perpendicularly.

For an old and unvarnished negative adopt e plan of soaking in a dish for some twenty inutes; then float on the paper, and proceed at first directed. For a varnished negative ld about four per cent. of alcohol to the water which the plate is immersed, and let the aking be continued for half an hour.

The compound plate, when dried, is taken, id an incision made in its surface all round, and ose to the edge of the glass. It is then imiersed in a shallow dish of water, to render the elatine pliable. After a quarter of an hour or), you may begin to raise a corner of the paper y the point of a knife, the plate being still in ie water. If the film still adheres to the glass, ontinue the soaking until a perfect separation an be readily made, the plate always remaining i the water to keep it moist. Finally, press the eparated joint sheet and film in blotting paper, nd leave it to dry. Should the negative appear) be too intense, waxing must be resorted to.

M. Bayard successfully performed the transfer xperiment before the French Society, upon a egative lent by M. Legray, and which was upposed to be unfavourable for the operation. Iuch interest was excited by an examination of ie numerous specimens thus transferred.

Baron Gros observes upon this process, that ie positives from such negatives are reversed s to right and left, and admits that, by placing he collodion side of the transfer uppermost in he copying process, this difficulty may be overome, but with the loss of sharpness of the riginal image. He therefore suggests that, for ransfers, the collodion plate must be impressed hrough the thickness of the glass; and he nticipates that even still greater beauty in the esult will be obtained, in consequence of the erfect nature of the collodion surface, which is ioulded upon the *polished* surface of plate glass. This mode of procedure was never considered atal to the success of the paper processes, where glass was necessarily interposed between the ensitive surface and the image formed by the ens. But, as the glasses vary in thickness, great care must be taken, so to arrange the rame, with relation to the ground glass, that erfect exactness of coincidence shall always be btained. Baron Gros expects that a greater lelicacy of detail, and a better gradation of tint, will be found to belong to positives obtained rom such negatives. The obvious saving of transport, and the avoidance of the dangers which attend the use of glass, incite one to urther trials in this direction. The glass and paper should be of the very best quality to ensure the greatest possible degree of perfection and convenience. Of course, by means of a prism, the image might be at once thrown in a suitable manner upon the plate, but it seems desirable, first, to see if the method above proposed may not be in all respects preferable. To be able to operate [rapidly] with dry collodion, and then to have the means of transferring the negative to paper, would be a real advance in practical photography.

ON POSITIVE PRINTING AND THE RESTORATION OF WASTE SILVER AND GOLD.

A PAPER upon this subject, by Mr. J. B. Hockins, was published in May last, in *Photographic Notes*, and it reappears, all but one paragraph, in the London Society's Journal for last month. We here give its substance:—

Six ounces of solution of nitrate of silver, containing ninety grains to an ounce of water, were made. Upon this bath sixteen sheets of paper 9×7 were floated; the paper being Towgood's, and salted by immersion in a twelve grain solution of chloride of ammonium. These sixteen sheets absorbed exactly two fluid ounces of liquid.* The residue, examined by analysis, contained only seventy-seven grains to the ounce; so that the bath lost not only the silver contained in the two ounces absorbed, but also six times thirteen grains additional, as shewn by the examination of the weakened remainder. 232 grains were extracted in making sensitive the sixteen sheets of paper—that is, fourteen and a half grains to each sheet, or, in money value, the cost would be about three-halfpence per sheet.

These, after printing, were treated in the following manner: they were first immersed for four or five minutes in a solution consisting of hyposulphite of soda two ounces, water six ounces; washed in a stream of water for one minute, and then immersed until toned in a similar solution of hyposulphite, containing in addition half a grain of chloride of gold to the fluid ounce. No more than six were fixed in eight ounces of the first bath, nor more than nine in the second, for reasons presently to be arrived at. The quantity of chloride of gold used was twenty grains, about equal to ten of metallic gold; for it was found that each picture of 9×7 required at least one grain of gold (two of chloride) to produce a good purple-black colour.

On burning one of these pictures, and treating the cinder with nitric acid, Mr. Hockin was astonished to find that he could scarcely detect a trace of silver on testing the nitric solution with hydrochloric acid. Another sheet was therefore exposed to light, uncovered by any negative, and left until it became nearly "bronzed." It was then fixed, toned, washed, and burnt like the one preceding.

The cinder was treated with dilute acetic acid, and water added. The liquid yielded no trace of silver. The residue was then acted upon by hot dilute nitric acid, and carefully washed. This residue was then ignited with pure nitrate of ammonia, and again washed. There was left absolutely nothing but pure metallic gold 0·06 grains. The nitric solution, plus the washings, gave, on precipitation by hydrochloric acid, a similar weight of chloride of silver—0·06 grains.

The various hyposulphite liquids were saved, mixed, and precipitated by an excess of sulphide of ammonium; the precipitate was collected and treated with strong nitric acid in excess; aqua regia was then added, and the excess of acid nearly all driven off by evaporation. The inso-

* This is the exact quantity ascertained as used, thirteen years ago, in the preparation, by brushing, of the papers used for the prints for the "Pencil of Nature." These prints were made, at a profit, for *five pence* each.—Ed. L. & M. P. J.

luble remainder, consisting of chloride of silver, was fused, and found to weigh 116 grains, equivalent to about 137 grains of nitrate of silver. The liquid filtered from the chloride, and treated with photosulphate of iron, deposited 4·60 grains of pure gold.

From the above facts certain conclusions may be drawn; but, before doing so, it may be well to mention another experiment which may indirectly assist us. Two pictures, having been over-printed, acquired rich tones in the gold bath, but the whites were not clear; these pictures were, therefore, returned to the first bath, in which six others had been already fixed. Here they were left till the following morning, when they were found to be perfectly sulphuretted, the whites having become of a deep yellow; but, on being floated for an instant on a five-grain solution of cyanide of potassium, the whites were perfectly restored, and the dark colour but little impaired.

The first conclusion to be drawn from the experiments now detailed is—That, in using a paper salted with about twelve grains of chloride of ammonium to the ounce, it will be necessary to add to the bath three or four grains of nitrate for every sixty square inches floated thereon; otherwise a forty-grain solution would soon become so weakened that the latter sheets would scarcely find silver enough to *instantly* convert the whole of the salt into chloride of silver. And, may not a weak silver bath, used with a strongly salted paper, be the cause of the curdy precipitate found in old baths? Has not the bath become too weak to coagulate all the albumen? If so, the albumen may dissolve in the upper stratum, and then coagulate on descending to the heavier and stronger solution below.

Secondly—The fact that acetic acid dissolved out no trace of silver in the cinder experiment would lead one to infer that the picture consisted of metallic silver. Had it been the hypothetical *blackened chloride* of some [guessing] chemists it would have been found with the gold after prefect ignition of the carbon, which was not the case. Moreover, the relatively small amount of silver found also points in the same direction, silver having, in fact, been, to a great extent, replaced by gold.

The sulphuration of the two pictures, left in hyposulphite contaminated with silver salts, is also instructive; and, although long known, is never sufficiently recognised. Whether the cyanide, by removing the sulphur in the state of sulpho-cyanide, will arrest the fading of such pictures is a question which time only can determine. It should be fairly tried.

Thirdly—That, inasmuch as little more than half the gold and silver employed was extracted from the hyposulphite liquids, all photographers should use the means of precipitating these metals pointed out below. The first washings should also be preserved. It is very desirable that a method should be discovered for deriving more benefit from the use of chloride of gold. One grain is consumed in doing the work represented in the picture by 0·06 of a grain of gold, equal to 0·12 of chloride.

Fourthly—The precious metals now so extensively wasted may, for the future, be retained by carefully carrying out the following system:-

The liquids used in developing and first was ing the collodion plate, &c., should be allow to run into a large tub communicating with t cistern [? sink] by a pipe which reaches near to the bottom of the tub—the overflow for t fluid deprived of silver should be at the top. little salt should be added from time to time ensure the separation of all the silver; but it remarkable that these waste liquids, when a lowed to rest for some time, become totally fr from silver in solution—the pyrogallic acid alo appears to reduce it. However, it will be we to keep a little salt in the tub, as that will a more rapidly than the vegetable reducer. In this tub neither cyanide nor hyposulphite mu be admitted. The plates should be fixed in bath of these, and the washing off conducted a place apart from the simpler silver washing When the fixing liquids become saturated th may be added to the other hyposulphite liqui and hyposulphite first washings, all of whic should be kept in a large tub, at a distance fro the laboratory, if possible. The gold and silv may be precipitated from these latter by passi into them a current of sulphuretted hydrog gas, or by adding to them a solution, made b boiling one pound of lime with one gallon water and half a pound of sulphur.

The various deposits may be collected on cloth filter, dried and reduced by fusion wi dry carbonate of potash or soda, or sent to th refiners, who perform the operation at a triflin charge.

These experiments and deductions are ve interesting, and the suggestions are likely to l useful. We do not, however, say that we ful accept all the inferences drawn from the fac narrated; but, as a very careful repetition the experiments will be necessary before an one is fairly entitled to suggest other inference we shall at present be content to say, that th gold and sulphur toning question has not y been sufficiently investigated. Mr. Hockin paper will certainly stimulate further enquir and we beg to thank him for the gratification w have derived from its perusal.—Ed. L. & M. P.

POSITIVES ON GLASS.

By M. Le Grice.

In the July number of the French Photographi Society's Journal, M. Le Grice states, that, h has for some years studied the production c direct positives upon glass, and he has at lengt adopted a process which gives favourable result with ease and certainty. His pictures have th strongest lights well rendered, without presen ing a metallic aspect. The pure whites preser their modelling although properly contrast with the deep shadows. The muscles of th face are well marked, a thing rare in pape portraits, which are chiefly set right by th hand of the artist.

All simply iodized collodions free from bro mides, fluorides, &c., and a bath unimpregnate with iodide of silver give pictures which ar simply black and white, having neither ha tint nor modelling. Hence the various addi tions to a normal collodion and bath. Tha combination which I have found to succeed bes says M. Le Grice, is one which has been fo

e time in use in Germany. It is as follows: in a flask, *very cautiously*, five grammes* of nine, and twenty-five grammes of absolute hol. Then pour this mixture into another containing five grammes of hydrated lime ked lime); stir, and add from twenty to nty-five drops of hydrochloric acid. After w days the liquid which rests upon the ssolved lime, loses its colour and becomes r as water. In this state it is used by ng ten, fifteen, or twenty drops of it to llodion iodized by iodide of zinc. It is be- od that a collodion containing this mixture nore sensitive than any other to the rays ch proceed from red and yellow objects.

ne image is rendered visible by sulphate of with the addition of boric or acetic acid, two or three per cent. of alcohol. The fixing fected by hyposulphite of soda, or by cyanide otassium.

o obtain negatives with this collodion, expose a longer time, and after the image is fixed washed, moisten it with a weak solution of ate of silver, containing just a trace of iodide lver. Then expose the plate to a very feeble sed light for a moment, and, without washing ge it into a solution of sulphate of iron, as e; wash again, &c. By this method we in negatives in which the half-tints are more ked than in those obtained by an ordinary ative collodion and developed by pyro-gallic . A too long exposure to the diffused light etimes causes the image to be transformed a positive, as seen when examined by smitted light. The same thing also occurs n the solution of nitrate of silver with ch the plate is, in this additional process, stened, contains too much iodide of silver.

THEORY OF THE DAGUERREOTYPE PROCESS.

By A. Claudet, Esq., F.R.S.

Continued from page 177.

paper communicated to the Royal Society une, 1847, an abstract of which was read re the British Association, at Oxford, M. udet stated that the red, orange, and yellow were capable of destroying the action of te light, and of restoring to the exposed uerreotype surface its former sensibility to te light, from the effects of which it had just n relieved by the action of the red, orange, yellow rays. It was to be inferred from e curious facts that light could not have omposed the surface; for if it had done so, it uld be difficult to understand how the red, nge, or yellow rays could combine again, one n the other, such volatile elements as nine or iodine, after they had once been arated from the silver. But at that date M. udet had not ascertained that the red. nge, or yellow rays were incapable of oring a bromo-iodized silver surface which been completely *decomposed* by light. The ct of light which the red, orange, and yellow s destroy, is not sufficient to produce that rough change of the surface, which an amount ight 3000 times greater accomplishes; in er words it is only the kind of action, t is 3000 times less intense than that which is required to produce the image without mercury — a feeble action that gives affinity for mercury,—which is destroyed by the red orange, and yellow rays. It does not seem that there can be a real decomposition during the short action which is sufficient to give an affinity for mercury, and consequently it seems to be right to attribute the formation of the image to that affinity only. White light, or the rays which accompany it, communicate to the iodized surface an affinity for mercury, and the red, orange, or yellow rays withdraw it. But there is a singular anomaly which may here be noticed, viz., that when the sensitive surface is prepared with *iodine alone*, the red orange, or yellow rays, instead of destroying the action of white light, continue the action, which ends in complete decomposition, and at the same time they carry on the action which gives the affinity for mercury. Still there is a further compound of iodine which is far more sensitive than the simple compound obtained by Daguerre's original iodizing method, which is far more sensitive than the latter, and on which the yellow, red, and orange rays exercise their destructive action, just as in the case of the bromo-iodide. The phenomenon of the continuing action of the red, orange, and yellow rays on the simple compound of iodine and silver was discovered by M. Ed. Becquerel, and soon after M. Gaudin found that not only do these rays continue the action by which mercury is deposited, but they also develop by their own power, without the agency of mercury, an image having the same appearance as that produced by mercurial vapour. M. Gaudin, not having observed the fact of the white silver deposit, which results from the complete decomposition of the surface by the action of light, could not explain the cause of the image brought out by the yellow ray. M. Claudet finds that the iodide of silver, without bromine, is about 100 times more sensitive than the bromo-iodide to that action of light which produces the decomposition that furnishes the white precipitate, or deposit of silver, while it is 100 times less sensitive to the action which gives the affinity for mercury. This seems to be another reason for supposing the two actions to be different. It may be that in the case of the iodide of silver alone, the complete decomposition being more rapid, and the affinity for mercury slower than when bromine is added, the red, orange, and yellow rays having to act upon an incipient decomposition, have the power, by their own photogenic influence, of continuing the decomposition when it has begun. This may explain the development of the image under red, orange, and yellow glass, according to M. Gaudin's discovery; but in the case of the bromo-iodide of silver, the red, orange, or yellow rays have to exert their action on the result of the affinity for mercury, which the surface possesses, begun a long time before the decomposition of the compound; and they have that affinity to destroy. It would appear that all the rays of light have the property of decomposing the iodide of silver in a shorter or a longer time, as they have that of producing the affinity for mercury on the bromo-iodide of silver; with the difference that on the former compound the separate actions of the several rays continue one

* 15½ grains the gramme.

another, and that on the second compound these separate actions destroy one another. We are to understand that, in the first case, all the rays are capable of effecting the same decomposition; and that in the second the affinity for mercury imparted by one ray is destroyed by another. This would explain the various phenomena of the formation of the two different deposits already described, and also explain the anomaly of the continuation of the action of light by the red, orange, or yellow rays, according to M. Becquerel's discoveries on the iodide of silver; and of the destruction of that action by the same rays, according to my own observations, on the bromo-iodide of silver. The red, orange, and yellow rays when acting on a normal surface are much less capable than the most refrangible rays, of imparting the affinity for mercurial vapour, on both the iodide and bromo-iodide of silver; and they destroy that affinity when it has been produced on the the bromo-iodide of silver by the photogenic rays. It follows that when the red, orange, or yellow rays are more abundant in the light than the most refrangible rays, the photogenic effect is retarded in proportion to the excess of these antagonistic rays. This happens when there exist in the atmosphere vapours capable of absorbing the most refrangible rays: under these circumstances the light appears yellow, but it is very difficult to judge by the eye of the exact colour of the light, and of the proportion of photogenic rays existing in the atmosphere at any given moment.

To be continued.

HISTORY OF PHOTOGRAPHY.—PHOTOGRAPHIC ENGRAVING.

By H. F. Talbot.

In pursuance of our plan of giving room to all papers, which are of importance, relating to the History of Photography, we insert Mr. Fox Talbot's Letter to the Editor of the *Athenæum*, describing the result of his experiments up to April, 1853. It is as follows:—"I now proceed to give you an account of my newly invented method of making photographic engravings upon steel. Of course, I have no need to observe that the art is at present in its infancy, but I have great hopes that it will very soon be considerably improved in all its details.

"The first thing to be done is to select a good steel plate, and to immerse it for a minute or two in a vessel containing vinegar mixed with a little sulphuric acid. The object of this is to diminish the too great polish of the surface, for otherwise the photographic preparation would not adhere well to the surface of the steel, but would peel off. The plate is then to be well washed and dried. Then, take some isinglass and dissolve it in hot water. The solution should be strong enough to coagulate when cold into a firm jelly. This solution of isinglass or gelatine should be strained while hot through a linen cloth to purify it. To this must be added about half as much of a saturated solution of bichromate of potash in water, and they should be well stirred together. When cold, this mixture coagulates into a jelly, which has very much the appearance of orange jelly. The method of using it is to liquify it by gentle heat, and to pour a quantity upon centre of the steel plate. Then take a rod, hold it horizontally, and spread the li uniformly over the plate. Then incline plate, and pour off the superfluous gela Let the steel plate be placed upon a stand, keep quite horizontal, that the liquid may run to one side of the plate. Then pla spirit lamp beneath the plate, and warm gently till the gelatine is quite dried up. W dry, the film of gelatine ought to be br yellow and very uniform. If clouded b appear upon the surface, it is a sign that t is too little gelatine in proportion to the bic mate, which must therefore be corrected. steel plate now coated with gelatine, is r to receive a photographic image of any ob First, let us suppose the object is one cap of being applied closely to the surface of plate; for instance, let it be a piece of l lace or the leaf of a plant. Place the o upon the plate in a photographic copy frame, and screw them into close contact. this frame in the direct light of the sun short time, varying from half a minute to minutes. Let it then be removed and the taken out, and it will be found impressed a yellow image of the object upon a grou a brown colour, as might be expected from well-known photographic property of bichromate. The plate is then to be plac a vessel of cold water for a minute or which dissolves out all the bichromate and of the gelatine also, from the photogra image, *i.e.* from those parts of the plate w have not been exposed to the sun, being tected by the object; while, on the cont it dissolves little or none of the gelatine which has been fully exposed to the rays. The consequence of which is, that ins of a yellow image we have now a white one still upon a ground of brown. The pla then removed from the water into a vess alcohol for a minute, and it is then take and placed upright on its edge in a warm p where, in the course of a few minute becomes entirely dried. This terminates photographic part of the operation. If plate is carefully examined while in this s it appears coated with gelatine of a yello brown colour, and impressed with a w photographic image, which is often emin beautiful, *owing to the circumstance of being raised above the level of the plate b action of the water.* Thus, for instance, image of a piece of black lace looks like a piece of very delicate white lace of si pattern, closely adhering to, but plainly r above the crown and polished surface of plate, which serves to display it very beauti At other times the white image of an o offers a varying display of light when exam by the light of a single candle, which indic *a peculiar molecular arrangement in the par of gelatine.* These photographic images often so beautiful that the operator feels al reluctant to destroy them by continuing process for engraving the plate.

"In order to explain how such an engra is possible, it is, in the first place, to be obse that the photographic image differs from

t of the plate, not only in colour, but, what f much more importance, in the thickness of film of gelatine which covers it. The coating gelatine on the rest of the plate is, comparaely speaking, a thick one, but that which ginally covered the image has been mostly ioved by the action of the water, a small tion, however, almost always remaining. It refore naturally happens that when an etch- liquid is poured on to the plate, it first ietrates through the thin gelatine covering image, and etches the steel plate beneath. t the next moment it penetrates likewise ough the thicker coating of gelatine, and is spoils the result by etching the whole of plate. Nitric acid, for instance, does this, l therefore cannot be employed for the purse. Since the other chemical liquids which capable of etching steel have a certain alogy to nitric acid in their corrosive propers, they also for the most part are found to l in the same manner.

"This was a difficulty. But after some earches I found a liquid which etches steel rfectly well, and at the same time is free from e inconvenient property of penetrating the latine film. This liquid is the bichloride of tinum. In order, however, to use it successly, it must be mixed with a certain quantity water, neither more nor less (I mean, to any terial extent), otherwise its action becomes egular. The best way is to make a perfectly turated solution, and then to add to it onerth of its bulk of water. Then correcting is by a few trials, a solution of proper strength finally obtained. Supposing, then, that we ve prepared such a solution, the operation of ching the plate is performed as follows:—The ate is laid on a table, and a small quantity of e bichloride being poured upon it, it is to be pidly diffused, and spread over the whole plate ith a camel-hair brush. Not much liquid is ured on, because its opacity would prevent e operator from distinguishing the effect proiced by it on the metal. For this reason it is rdly necessary to make a wall of wax round e plate; that is, if the portions to be etched e confined to the central part of the plate, d do not approach very near to the edge. he effect of the liquid upon the plate is not at rst visible, since it disengages no gas; but fter the lapse of a minute or two, the white hotographic image begins to darken, and soon ecomes black in every part. When this change complete, the image often looks very beautiful ough quite altered from what it was before. he operator should carefully watch the image ntil he thinks that it is finished, or not likely be further improved or developed by continug the process any longer. He then inclines he plate gently, and pours off the liquid by one orner of the plate. The plate is then dried vith blotting-paper, and then a stream of salt vater, which is better than fresh water for this urpose, is poured over the plate, which removes ll traces of the etching liquid. The plate is hen rubbed with a wet sponge or linen cloth, vhich in a short time detaches and removes the ilm of gelatine, and discloses the etching that as been effected. When the object is not of a ature to be applied directly to the surface of the plate, the most obvious method of proceeding is, of course, to place the propared plate in the focus of a camera, and to direct the camera to the object. But in consequence of the low degree of sensitiveness of bichromate of potash, this would take, generally speaking, too long a time to accomplish. The better way in practice, therefore, is to take a negative photograph of the object on paper with a camera, and from this to obtain a positive copy either on glass or paper, which should be very uniform in texture, and moderately transparent. Then this positive copy is placed on the plate in a photographic copying-frame, and being placed for a few minutes in the sun, it impresses the plate with a photographic image; which image, etched as above described, and printed off upon paper, will finally give a positive representation of the object. If the objeet depicted upon the plate by the sun's rays is broad and uniform, for instance, the opake leaf of a plant, then, of course, the etching is uniform also. When this is printed off, it produces an effect which is not always satisfactory. I will therefore now explain a modification of the process which destroys this uniformity, and which in many cases produces a great improvement in the general effect.

"For this purpose I must remark, in the first place, that if a piece of black gauze or crape is the object selected for representation, it produces an engraving of itself which is marvellously accurate. But when two folds of the gauze are laid across each other obliquely, then the resulting engraving requires a lens in order to separate from each other and distinguish clearly the lines belonging to the two portions of the gauze. Now, if this engraving is printed off, the result offers to the eye at a moderate distance the appearance of a uniform shading. Now, I avail myself of this circcumstance to modify my original process as follows:—suppose the object to be the opaque leaf of a plant of irregular outline, first, I cover the prepared plate with two oblique folds of black crape or gauze, and place it in the sunshine for two or three minutes. The effect of this is to cover the plate with a complicated image of lines passing in all directions. Then the leaf is substituted for the crape, and the plate is replaced in the sunshine for two or three minutes more. The leaf being then removed from the plate, it will be seen that the sun has obliterated all the lines that were visible on the parts of the plate exterior to the leaf, converting all those parts to a uniform brown. But the image of the leaf itself is still covered with a network of innumerable lines. Now, let this be etched in the way already described, and let the resulting etching be printed off. The result is an engraving of the leaf, which when beheld by the eye at a certain distance appears uniformly shaded, but when examined closely is found to be covered with lines very much resembling those produced by an engraver's tool, so much so that even a practical engraver would probably be deceived by the appearance. This crape arrangement I call a *photographic veil;* and, as I think it likely that the idea will prove useful, I will make a few more remarks upon it. It is clear that an arrangement composed

of two thicknesses of ordinary crape or gauze is but a rude attempt at a photographic veil. To realize the practical utility that may result from the idea, supposing it to be borne out by further experience, it would be proper to fabricate a much finer material, and to employ five or six thicknesses of it, or else to cover a sheet of glass in any convenient manner with an innumerable quantity of fine lines, or else with dots and specks, which must be opaque and distinct from each other. The result of practically employing such a method, supposing always that it answers in practice, as I think it probably will, would be an etching apparently uniform, but really consisting of separate small portions, in consequence of which it would hold the ink much better, and other obvious advantages would also be obtained. Another mode of accomplishing the same object is to cover the plate originally with an aquatint ground. But then a fresh one would be required for every plate, whereas a single *veil* would serve for any number of plates in succession. Experience alone can decide between these different methods. When the etching is finished, the plate should be very soon coated with wax to protect it. A few hours exposure to the atmospheric air rusts and destroys the etchings when newly made, although it does not do so afterwards. The oxidation only attacks the lines of the etching, the rest of the plate sustaining no injury, if the air is tolerably dry.

"Having thus described the method of producing the photographic etchings, it would, I think, extend this letter to too great a length were I to add any remarks upon the theory of the process, which will better be deferred to another opportunity.

LACOCK ABBEY, *April* 25.

TANNER'S WET PAPER PROCESS.

UPON the first appearance of Mr. Talbot's calotype patent, the late Mr. Robert Murray sent a brief account of the specification to his friend, Mr. Tanner, who was at that time on the continent. Mr. Tanner soon found that with foreign paper it was not possible to adhere to the directions given by Mr. Talbot, whose experiments had of course been made on English paper. Mr. Tanner, being a chemist, was soon enabled to modify Mr. Talbot's process in such a way that French and German papers could be used; the results having the advantage of being obtained in much less time than when English paper was employed. Portraits were taken from time to time and sent to England, to the astonishment of some few who considered the calotype to have become of doubtful utility, as far as portraiture was concerned. Mr. Tanner taught his process to M. Blanquart Evrard, of Lille. Some time afterwards, Mr. Tanner and his friends were surprised to find that M. Blanquart Evrard had published a photographic process on paper which was scarcely even a modification of Mr. Tanner's, and this without the slightest acknowledgement of the source of his apparent skill. The French press soon hailed M. Blanquart Evrard as a discoverer! and yet he took no pains to undeceive the French public. At length M. l'Abbé Moigno, in his *Repertoi* *D'Optique Modérne*, set matters to rights, ar related the history of M. Blanquart Evrard tuition. So far had matters gone that even M Talbot had to reclaim against the astoundin assumptions of the French press. The whole photography on paper, in a practical sense, w supposed to be due to France! But we mu here do M. Blanquart Evrard the justice to sa that he has informed us that *he* never thougl of claiming the invention of Mr. Talbot, ar that he only took credit for popularizing, th was the word, the invention in France. Sti not a word about Mr. Tanner. Was this ing nuous M. Blanquart Evrard? *We* had to lear from the Abbé Moigno first, and then from M Tanner himself, the true history of this tra saction. Those who, like ourselves, are for of recording the *true* history of inventions an improvements, will understand with what so of feelings we cancelled the notes which resulte from our early conversation with M. Blanqua Evrard.

Mr. Tanner's process is simple. We tak French, or the so-called German paper Messrs. Linneman and Flinsch, of Frankfor which paper we have been informed is also French manufacture; and steep it for som minutes, from ten to twenty, in a solution *pure* iodide of potassium. We then suspend to dry, attaching a piece of blotting-paper t the lower part of the sheet, so as to drain awa the excess of liquid. The paper, when dry, ready for use, but may be kept some time in well-closed portfolio. To make it sensitive w prepare a solution of aceto-nitrate of silver, about thirty to fifty grains to an ounce of wate with one drachm of acetic acid. This solutio we pour out upon a piece of glass, which larger than the paper to be made sensitive; w then float on the paper and leave it to soak fo three or five minutes. In the meantime w place upon a slate, or upon another sheet glass, a piece of wet blotting-paper, with quit an excess of water upon its surface. We no take the sensitive paper off the first glass an apply its back to the wet blotting-paper, t which it adheres perfectly. We allow the whol to drip for a moment, and then place the slat or glass, and paper into the usual plate holde The paper, it will be observed, is directly ex posed to the lens; but glass may be interpose if for any reason the plate must be long kep before using. M. Martens' best early pape pictures were obtained without the use of th second glass. After the exposure in t camera, which should be as soon effected a possible, the paper is removed and placed fa downwards upon a glass plate, containing nearly saturated solution of gallic acid. Th image soon develops, and is fixed in hypo sulphite, and waxed, or *not*, in the usual way A fresh portion of aceto-nitrate is then poure upon the glass, and another sheet prepared.

Such is Tanner's process, as used by M Martens and others; but here, as in other case additional agents have been combined with th iodide of potassium—bromide of potassium chloride of sodium, cyanide of potassium, &c have been employed in addition, and it must b confessed with apparent success. The picture

ained in the latter case are more intense, ugh it is quite a question as to whether :eased sensibility to either white or coloured ıt can be obtained by such means. There is ch room for experiment as to the time of im- rsion in the iodide, and the time to be allowed contact with the aceto-nitrate. If we do mistake, Mr. Tanner told us that some of most sensitive papers were prepared by a *nentary* floating on iodide of potassium, fol- ·ed by blotting off, and a contact of a *few nds* only with the aceto-nitrate. The par- ılar sample of paper also must be taken into ount; and, as the elements of the process so few and simple, no one can object to ɛe a few preliminary experiments with the ·er and materials they may have at hand. ꞉ salts, mixed or simple, should be in the portion of 500 grains to a pint of distilled :er. The nitrate of silver solution may be strong as fifty grains, but thirty should be t tried. We once found that a bath which l been used for some time to excite albu- ıized plates gave a more rapid result than a ıhly made solution. The influence of organic tters over these processes is not sufficiently lerstood. The action of this bath was re- rkable, but how shall we give directions for preparation of one which shall be similar? wever, by following the simple plan already cribed, successful results may be obtained. ꞉ only difficulty here, as in the Talbotype wax paper processes, is to obtain a paper ch shall be uniformly good in texture.

Ve shall, in a subsequent number, recur to ꞉ wet process, and give some additional for- læ, although we believe the essential details contained in the account given above.

THE DRY COLLODION PROCESS.

By R. F. Barnes.

:he attention of the reader has been, else- ere, drawn to the pamphlet of Mr. Barnes ing his lengthened experience upon this sub- t. His remarks upon the *Preparation of the umen* will well illustrate the detailed manner which his instructions are given :—

:he great objection to the use of albumen is difficulty of getting the solution perfectly ar and sufficiently limpid to flow readily over plate. By adopting the following method resulting fluid is beautifully transparent, irely free from "floaters," and is as easily lied as collodion itself. The solution is pre- ed as follows :—

White of Egg (new-laid)......	2 ounces
Distilled Water..................	6 ,,

ıt up with a glass stirring rod so as to well the two fluids, but not sufficiently so as to vert the whole into a frothy mass. Then l about thirty drops of glacial acetic acid ite crystallizable). The effect produced uld be to precipitate the greater portion of albumen in a flocculent mass, converting mixture into a curdy fluid. Some eggs, taining probably more alkali than others, uire a greater proportion of acid to partially arate the albumen. The acid should then be led until the flocculent precipitate manifests elf, the fluid being kept stirred during and after each addition of acid. When a sufficient amount has been used allow it to stand for a few minutes, and then strain it either through a clean piece of muslin or fine sponge placed in the neck of a funnel. This gets rid of the greater portion of the flocculent deposit, and renders the liquid sufficiently limpid to pass through ordinary filtering paper. It generally requires to be filtered two or three times before it is sufficiently clear for use. Care should be taken to pass it two or three times through the same filter, as at the first filtration fibrous particles are almost invariably carried off the paper, and are to be found floating in the liquid. The presence of this foreign matter would produce streaks and stains in the resulting plate.

The albumen will keep good, in moderately warm weather, for about one month. The eggs should be newly laid; if not, it will be impossible to obtain the solution perfectly limpid, however frequently and carefully it may be filtered.

The glass plate *must be well cleaned with alcohol*, and if of a large size [plates ten inches by twelve inches were used by Mr. Barnes], placed on a pneumatic or other plate holder. The albumen solution is then poured upon the plate, facilitating the spreading of it by the use of a glass rod. This last operation is not always required, the albumen generally flowing very readily, especially if the plate be cleaned with alcohol. When the whole of the surface of the plate is covered, incline it slightly, so as to allow the surplus solution to run off. The bottle into which it is returned should be supplied with a funnel, as the albumen runs off the plate at half-a-dozen places at once, and much of it is lost. Let the plate drain for about half a minute, and then hold the back of it to the fire, first warming the upper corner of the plate. As soon as it begins to steam the temperature must be lowered by withdrawing it to a greater distance from the source of heat. The only guide as to the heat applied is the amount of warmth that the fingers of the operator will conveniently bear. The plate will dry in about *two minutes*.

These albuminized plates may, if desirable, be stored away in plate boxes, and the subsequent coating of collodion be only applied as the plate are required for use. In this case and in very damp weather, the plates before coating with collodion must be warmed, to drive off any moisture they may have acquired. . . . . In the process of coating plates a large quantity of albumen should be poured on. By taking this precaution any particles of dust, &c., will float on the surface, and be carried off, whereas, were only a small amount to be used, they would be likely to adhere to the glass.

The dried albumen plate is now ready to receive the collodion film and be excited in the silver bath; but for the rest of the details the reader must go to Mr. Barnes' pamphlet, where he will learn that "it is perfectly impossible to obtain *very sensitive* dry plates without employing some substance *to support* the collodion."

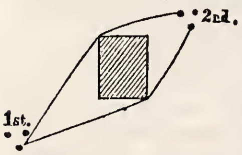
Erratum.—In our account of the French Photographic Society's meeting in our last number, M. Jamin's name was accidentally mispelled "Tamin."

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—I have never been so profoundly impressed with a sense of my ignorance on any subject as I now am on this. I hereby recant all my former opinions in respect to the meaning of the word, or the value of the so-called "Stereoscopes:" and I am the more able to do this without great personal injury, as I never had any great respect for either.

I did, however, believe (how easy it is to be mistaken,) that the chief claim the subject had, either philosophically or otherwise, to attention, was its capability of producing pictures as they would be seen by both eyes at once. All the instruments called *Stereoscopes*, ever seen in America, certainly induced this idea, as the "slides" were made for being so looked at; but how this happened I know not, unless they were the cast off instruments of Europe, sent here to find a market as soon as the *true* theory of making them was known there. Such must have been the case without doubt, for in the *Liverpool and Manchester Photographic Journal* of June 1st, this day received, there is laid down *ex cathedra* by the Editor, "that it is not for a moment supposed that a Stereoscopic picture is a representation of nature as seen by the two eyes from any single point of view: still the result is *natural*, inasmuch as it recalls to us the original object in a manner free from distortion." After this (if correct,) there can be no reason why we should be limited to a distance of fifteen or any other number of *metres* or even furlongs—for we may take the first view from one angle so as to include the two adjoining sides, but for the second, the camera may be placed in front of the diagonally opposite angle, as in the sketch, and so get the two adjoining sides — thereby when placed in the Stereoscope we may combine them into one view, and thus at once view the object *all round*. This would be perfectly "Stereoscopic," inasmuch as by seeing every side of an object at once, it must be more "*natural*" than by the usual mode of only seeing a portion of it from stations fifteen metres apart. Had *such* Stereoscopes been in use at the date of the battle in regard to the silver shield *versus* the gold one, the ancient knights would never have spilt their blood as they did on that occasion.



Hogarth's celebrated "*Absurdities of Perspective*" were not so absurd as he and others have hitherto supposed, and with the cameras fifteen metres apart, we might readily see both ends of a church, or both heads of a barrel at once! Each is "natural" and "free from distortion."

26, Second Avenue. New York, WM. ROSS.
18th June, 1857.

[We insert our correspondent's letter to show how even the most zealous amongst photographers may misunderstand this perplexed question of the stereoscope. We never proposed to have both ends of the barrel depicted at once. We have spoken of "an angle of from five to ten degrees." Take the stereoscopic portrait of the barrel at some such angle and then examine it in the stereoscope, and we will answer for it that our correspondent will reconsider his views, and will, we trust, be kind enough to favour us with his final determination as to this matter.—Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—I beg to say that I have read with great interest, (in the number of the *Liverpool and Manchester Photographic Journal*, for the 1st of August,) your description of an apparatus which M. Clau employs in copying engravings.

This is a department of photography which should wish very much to practice; and I ha from time to time, procured almost all the Engl Manuals, but, except incidental notices on the su ject in these and in the journals occasionally, I ha not been able to find anything relative to it.

It would be very desirable to know how M Howlet, Mr. T. Thompson, and others, who seem excel in this department, manipulate.

Will you permit me to suggest that you would co fer a great benefit on me, and no doubt on ma others of your subscribers, if you would favour with a paper in the *Liverpool and Manchester Ph tographic Journal*, giving full details of the vario modes of proceeding.

Portarlington, Ireland, M. HANLON, M.D
20th August, 1857.

[We shall do our best to comply with the wi expressed in Dr. Hanlon's letter; and this early as possible. We may at once say that there no real difficulty in this branch of the art. A lo focus lens, with a one-inch or a half-inch stop, a the collodion made by Mr. Hardwich's formul (which can be purchased or not,) with the additi of glycyrrhizine, will certainly yield, with ordina *perseverance*, good results. We should also try M Sidebotham's last dry collodion process for this pu pose. The print may be placed in the sun or no we have seen good results obtained by allowing t sun to fall obliquely upon the print. The appearan on the ground glass will determine when the utmo distinctness has been obtained by the proper disp sition of the light.—Ed. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

Mr. Wm. Ross, New York.—Your "scioptric pi tures" have been placed in our hands; they shall b disposed of as you wish. We have not yet suf ciently studied them to say more than that th appear to be wanting in definition. Pictures take by Martens' panoramic camera are very well define Your specimens are not the less welcome.

Z.—The multiplication of dry processes must f the present be viewed as a "necessary evil." It rarely the case that the best formula is given at on by the inventor of a process. Other workers have hand in the perfection of the original plan, and i this case we must give space to every new modificatio which comes from a practical photographer. W shall not be content until there exist some compete and disinterested tribunal before which photograph inventors may exhibit their skill competitively.

X.—The nitrate of silver question is a perplexin one, and yet it ought to be perfectly simple. Th crystals, if devoid of free nitric acid, are the bes It requires very great care to fuse these crysta without slight decomposition; but if properly fuse from a pure sample the two are supposed to b identical, excepting in physical characters. We sa crystals are the best, because a *commercial* fus mass *may be* the result of the evaporation of solution of impure character. In the process crystallization the "mother liquor" retains most the impurities.

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THE LIVERPOOL & MANCHESTER
Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1*st and* 15*th of each Month.*

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The

Liverpool & Manchester Photographic Journal.

NEW SERIES. No. 19.—OCTOBER 1, 1857.

: meetings at Liverpool, Chorlton, and ningham, furnish our columns to-day with ıy matters of interest relating to various ıches of our art. We are glad to see so ly a commencement of the winter session. Corey's address, at Liverpool, ıs as usual racterised by his peculiar "talent" of genial ursiveness. We wish most heartily that he all other of our Liverpool friends would e an earnest of their great love of original *ylish* composition, by adding to the bulk of correspondence columns. We sometime gave them a wishful hint, but it was perhaps too indistinct a character to be rightly in- preted. A careful review of all the photo- phic journals hitherto published, has con- ced us that twenty-four columns, so close full as ours, are too many to record the ly *useful* discoveries—observe *really* useful hich are made during one poor fortnight! v, correspondence on points of undoubted rest, and of a *thoroughly practical character*, always be maintained upon a subject on ch many minds are engaged. But, then, correspondents should be *many*, for there few of us, editors or non-editors, who can be ened to week after week with satisfaction, much less with profit. Our greatest ex- imental philosophers work for months, and n years, before putting forth to the public ir statements of FACTS; and we have the hority of the "Prince of Experimentalists" saying, that he often works long and fruit- sly, and has nothing to put forth, even after eks of labour. Photographers alone seem to nk there is some royal road to discoveries l their perfection—*verbum sap.*

n our last impression, we briefly alluded to formation, at Liverpool, of a branch of the chitectural Photographic Association, and to appointment there of an Honorary Secretary, . Ellison. The present association commences career under "auspices" as favourable as se which attended the starting of the Photo- phic Society. C. R. Cockerell, Esq., R.A., is President; the Trustees are Philip Hard- k, Esq., R.A., Sidney Smirke, Esq., A.R.A., l William Tite, Esq., M.P.; this latter tleman's name is a guarantee that the *iness* of the association will be duly managed. s continuing to perform with energy, notwith- nding his public engagements, the duties of Honorary Secretary to the London Institution, after nearly a quarter of a century's labours in that direction, may justify us in the assumption. The association has for its objects, the pro- curing and supplying to its members, "photo- graphs of architectural works of all countries," as being eminently calculated to benefit the architectural profession, and also the public, who will thus obtain representations of really great works at a moderate cost: an increased interest in, and love of the art, we might have said *both* arts, will naturally be thereby promoted. Basing their estimates upon the statements of individual photographers, the committee of the association consider that at least three copies of the largest ordinary size, viz., twenty-one inches by seventeen inches, might be issued for a guinea subscription, whereas one of them is now ordinarily sold for about twenty-five shillings; smaller sizes might be issued in considerably increased numbers; and it is thought that probably from thirty to forty stereoscopic views might be given for a similar subscription. Here is a stimulus to the wavering looker-on: architects will need only to be told, in addition, that they may obtain, not only the relative proportions, but also the actual sizes of buildings and their details, through a simple measurement taken on the spot by the photographer; but we need say no more to further the objects of the association: Mr. Ellison, of 33, Bold Street, will receive the names of those who wish to be subscribers.

Some of our readers will be glad to learn that the council of the Photographic Society of London have succeeded in obtaining rooms which, it is believed, are suitable to all the present wants of the society; but we shall have something to say upon this head by-and-bye. The upper part of a conspicuously placed house on the left-hand side just entering Leicester Square, from the continuation of Piccadilly, has been taken as the best that, on the whole, could be met with. The Society has been so long looking for a home that we rejoice that anything approaching fitness has been obtained. It is not possible for an infant society, strong though it may be, to reverse the adage which tells us that "Rome was not built in a day."

We have also much pleasure in announcing that the managers of the London Institution are building a glass room as a necessary adjunct now-a-days to a good chemical laboratory, which they possess. It has been the want of this which has greatly kept us back from fulfil- ling a promise we made to test the chief of the new processes which we, from time to time, print in these pages.

LIVERPOOL PHOTOGRAPHIC SOCIETY.

THE first monthly meeting of the fifth session was held on Tuesday evening, the 22nd Sept., at the Royal Institution, Colquitt Street. The chair was occupied by Mr. COREY, one of the vice-presidents, and there was a fair attendance of members.

A number of specimens of the photographic art were exhibited, the most important and interesting being a series of stereoscopic views from Egypt, taken by Messrs. Frith and Wenham. They were much admired, as also was a portfolio of large prints, by Bisson Frerés, Mr. Fenton, and Messrs. Le Gray, Belloc, Baldus, and Braun, forwarded for the inspection of the Society by Mr. Cros, of Bold Street. A marine view, by M. Le Gray, displayed with remarkable fidelity the breaking of the waves upon the sea shore. That this effect had been legitimately obtained by instantaneous action, and not "put in" by the ingenious artist, was evident by the general appearance of the picture, the whole of the waves bearing testimony to its accuracy and honesty. The Chairman exhibited several very beautiful collodion pictures, taken on board a yacht, by Mr. W. J. Cox, of Devonport.

The HON. SECRETARY (Mr. Keith) drew attention to the great advantages which are likely to fall upon photography in general, and the impulse that will, in all probability, be given to the art, by the establishment of the "Architectural Photographic Association"—a society which numbers among its promoters some of the leading architects of the country, and which had received the sanction of some of the most eminent photographers of the day. He said he had received a copy of the report of the Provisional Committee, from which it appeared that one of the objects of the Association was the procuring and supplying to its members photographs of architectural works of all countries. It was thus eminently calculated to be of benefit to the architectural profession, by obtaining correct representations of those works, and to the public, by diffusing a knowledge of the best examples of architecture. As the society would have no vendor's profits to pay, it would not only be able to supply its members with the best photographs, at considerably below the selling price, but would be in a position to form a collection of photographs; and their exhibition, from time to time, might be made to further the interests and objects of the Association. Mr. Ellison, of 33, Bold Street, is the local Hon Secretary.

Mr. J. A. FORREST (Treasurer of the Society) announced that he had prepared a book for the reception of photographs by members of the Society, whose property it would be, and remain at the Institution. He should be happy to receive contributions, with detailed descriptions of the modes of printing. It would form an excellent record for reference at any time.

Mr. Bell presented, for this purpose, four wax-paper specimens (views at Malvern), which he had prepared during the recess, and Mr. Forrest contributed twenty-six impressions of his own.

The Chairman exhibited a photograph of Broadway, New York, taken by Mr. Ross, of that city, with his "scioptric camera." the peculiar quality of exhibiting both s the horizon at once, a feature which elicit remark, that when Mr. Ross has broug camera to perfection, he will be able to sho "middle and two ends of a barrel" at one p

The CHAIRMAN then proceeded to deliv following address:—

Gentlemen,—It is with more than or pleasure that I greet you on this the o evening of our fifth session; for thoug numbers may be far less than could be d yet I am happy to acquaint you that t periment I so long urged upon the Cou raise the amount of the subscriptions ha successful. The proceeds of these subscri are more than adequate to meet the de upon the Society, and we have the satis of knowing that perfect unanimity amongst those who have enrolled themsel our ranks, we therefore now recommen meetings under far more flattering au than at any previous part of the So existence.

Most of you, no doubt, have been able away into the country, to enjoy the beau the scenery, the fresh air, and the char ideas; few, doubtless, would think the recr complete without the camera, and hav soned your relaxation with what the unini are pleased to designate increased labo anxiety; we pity their want of taste, an forward to a vast increase in our store of ledge, by each bringing to the general the result of their experience and the quences of their observations: no matte insignificant such details may seem at the they will be of inestimable service in t manifold speculations and theories whic have passed current for sound doctrine; it remembered, our practice is of so recen that much of it is derived from the unsup dicta of enthusiastic, and in many case sionary experimenters. Another conside also that would render sound practical inf tion more than ordinarily acceptable is t of the *litera scripta* being at present ver and meagre, the English Journals, with t ception of *The Notes*, are almost dev interest, and their editors driven for l matter to compilation from old and almo gotten authors,* or else to fill up space topics not strictly within the sphere the fess to confine themselves to. The Ameri only a *resumé* of the most notable matter English; the Bombay, it is to be feared other occupations than the camera, fo publications have not reached us; and ev French periodicals—those fertile fields f journalist, whence most of our flowers o position have been culled—are only fille abstruse calculations of the everlasting nomenon of the stereoscope, or else retali of our own reports from them. The onl novelty of which we can speak would hav presented to you this evening in a far practical and elegant form than was eve templated by its originator, M. Sella, b

* Better to revive "forgotten authors" of repute, tha our pages with the rash "dicta of enthusiastic and, cases, visionary experimenters."—ED. L. & M. P. J.

est is not yet quite satisfied with the present e of his experiments. M. Sella has cer- y started a principle, which, if it can be car- out as it seems likely from the ample evidence iave, will solve the enigma of the stability hotogenic prints, and bid fair to secure for uthor the princely premium of the Duc de nes, for the very liquid with which we write s testimony to the all but imperishable ities of the system.

appeared as though in our haste to secure the prominent nuggets, we have rushed ard searching only for what the nobler ıls, gold and silver, could produce; by-and- we find that platinum (less valuable than the , but almost quintuple the price of the r) was a promising fixing re-agent; but at it is perceptible that there are very many ns of quality in the baser metals hitherto looked, that in the aggregate will more ı repay the labour of a painstaking research; ou who have read on this interesting topic, know that iron, just as it is suited for the ose of the handicraftsman better than the ly metal, gold, seems also in photography e fitly adapted to withstand the assaults of onquering time; farther than this, copper, tofore regarded at least as useless, nay ost considered pernicious, now plays a very ninent part, and will eventually figure very iently as a medium for conveying the mimic erns that light brings to our notice and regard. s highly amusing to contemplate the way which that fosterer of all that savours of nt—viz., Mr. Sutton—chants his "Io Pæan," he more than probable success of the gallate ron, alias writing-ink, by whose indelible ns it appears our proofs are to be secured ı "fading away." We perfectly coincide ı him, and believe that, as the value of the ls and parchments that secure to us our erty depend upon the unchangeable quality he ink† by which the conveyancer has en- ssed them, so the proofs accomplished by sturdy old endurer—iron, if treated by the t corrosive of all the acids, or, in other ds, that best capable of resisting the attacks oxygen, hydrogen, and sulphur, the sore royers of our most cherished labours, will he most likely to be handed down to suc- ling generations; and I will ask all present ey can be sure that their best efforts at sent will abide until the son that is born to- shall live to have his intellect so enlarged o comprehend the efficacy of his father's work. may be expected I shall carry out my own cept, and set the example by narrating my ı observations during our recess. These, n the pressure of more important engage- nts, have neither been so important nor so nerous as I could desire, but they have been fly directed to the quality and condition of ns, both positive and negative; and, I am l enough to say, hints based upon actual eriment will be worth attention on this damental principle of all good pictures. A d working collodion is of most material importance, doubtless; but its place may be supplied by albumen. Not so a defective bath; nothing will avail you if this be wrong. Nor do we attach that importance to any infallible form of developing agent, such as two subtile disputants of the present day are waging amicable war about just now. I have too high a value for both of them to venture an opinion in behalf of either. I will only invoke your admiration of the consummate skill displayed in the special pleadings on each side, and return to the matter in hand. The primary strength is too generally supposed to continue so long, or nearly so long, as the liquid remains in available quantity; for it is believed that, if the silver be abstracted by repeated immersion of plates, a proportionate bulk of water hangs to those plates, hence the balance of strength remains much the same, though the volume is diminished; and this error I have seen confirmed by the use of the hydrometer, for the experimenter has triumphantly pointed to the scale as exhibiting the proper standard of argentine salts in it. True; but what have those salts become? Look at the hue of the liquid, and say what is the cause of that yellow tinge. Why the redundancy of iodide, that has become generated by repeated immersion. True farther; it is the iodide that forms the nascent image, but it is only by a preponderance of nitrate, which after a time can hardly be said to exist; it is then inevitable that the bath must be strengthened, and much of this iodide removed. How? Thus: determine how much more of the crystallized (not fused) nitrate you intend to add; put just so much water into your bath as would be requisite to dissolve it at the rate of thirty grains to the ounce; the iodide that was soluble in the bath of previous strength is no longer so, and the solution becomes turbid; leave this a whole night, and it will be found, precipitated at the bottom of the vessel; pour off the clear liquid in the morning, dissolve in it the nitrate of silver previously resolved on, add about as many drops of nitric acid as you have super-added ounces of water, (more may probably be necessary for reasons beyond the limits of this paper to describe) you will then find your bath in all its pristine efficacy. Now as we have seen that the acidity of the positive bath is a matter of primary importance, so the utter absence of that acidity is of equal consequence in the negative bath. While out with two of our most esteemed members during the hottest day of this summer, I could not, with all my best endeavours, get intense negatives, while these gentlemen with the use of the same chemicals had no such difficulty, they were working with plates of stereoscopic size, while mine were twelve inches square. On examining my bath on my return I found it to be powerfully acid; in their small plates this had not mattered so much, but the aggregate quantity had been fatal in the immense surface of mine. I evaporated the whole eighty ounces to dryness, urged on the heat till I saw fumes of nitrous gas evolved; dissolved again, and have since had no such difficulty.

Before concluding I would again urge upon the members the expediency of raising the dignity of the art beyond the mere toy of the

† Writing ink is *not* unchangeable—carbon, or *Indian* ink, is angeable. Time, "that teacher of hard and unpalatable ıs," has shewn, that ink exposed to damps and an impure sphere, will change. Mr. Sutton, with his chant, is "a day e the fair."—Ed. L. & M. P. J.

fancy, or the recreation of the leisure hour. The known fidelity of photography has caused it to be received ere now as evidence in a court of justice; why then should we not exercise its faculties to record all great events, such as those that teem with good to the rising generation, like the laying of the foundation stone of the future library, or to chronicle the vast changes that are continually being made to improve this thriving town? Already we have lived to regret that there is nothing extant to remind us of the quaint old edifices, that while they encumbered the thoroughfares yet gave a picturesque interest to the streets and lanes, many of which there may be an urgent necessity hereafter to recall. I before insisted on this while having the honour to preside over your meetings, and I again press it on your notice. I also urged you to use it as a means of representing the physical peculiarities of the human species, of which so endless a variety are daily to be seen crowding this busy port. To the ethnologist this would present a volume of the most undying interest; but like many other and nobler "enterprises of great pith and moment, its current" is turned "awry," and it has lost "the name of action."

Mr NEWCOME, of the London school of photography, exhibited a very ingeniously contrived portable collodion knapsack camera, containing every thing necessary for a photographic campaign, the whole not weighing more than eighteen lbs., respecting which he gave the following particulars:—

The camera presented for notice this evening is perfectly adapted for the manipulation of collodion in the open air. The short exposure required for the wet collodion process will probably long give it the precedence of other modes of photography; and, when the pictures thus taken can be developed, fixed, and varnished on the spot, they afford great satisfaction to the labouring photographer. Unquestionably it is better to return home with a day's splendid spoils, which one can contemplate as so many "birds in the hand," than to be ruminating on the possibility of having to trudge over the two weary miles again to-morrow, because the undeveloped negatives *may* not be perfect.

The requisites for a perfect out-of-door camera (which do not seem hitherto to have been completely attained) are—

1. Lightness.
2. Portability.
3. Facility for certain and rapid manipulation.

1. The collodion knapsack may be considered light, for the entire weight, with all the apparatus and *fluids*, is eighteen lbs. The apparatus consists of—

Two gutta percha bottles for developing and fixing solutions, each holding eleven ounces.
One ditto of twenty-four ounces, for water.
Collodion bottle.
Reserve box, containing bottles for the chemicals, developing glass, &c.
Gutta percha developing tray.
Plate box for eleven plates, seven inches by five-and-a-half inches.
Water-tight nitrate bath (fitted).
Gutta percha developing tray.
Dusters and glass cloths.

These articles are packed inside the cam
which may then be folded up, and enclos
the leather knapsack, with straps, &c.

2. The portability of the camera is o
partly to its small dimensions, and partly t
knapsack shape, as it may easily be strappe
the back. When opened, the knapsack
forms a tray (with a handle formed by
straps), in which the chemicals, &c., are
when manipulating. When the pictur
finished, the operator may go, with this tr
one hand and the camera in the other, in se
of a new subject, without the trouble o
packing.

3. The certainty and rapidity of its a
has been already proved by the hundre
negatives taken with it. In one morning
the crowded surface of Yarmouth beach)
subjects were selected, and photographe
little more than two hours. These advant
are owing to the ease with which the pla
placed in the nitrate bath, and transferred
thence to the plate holder; and to the dev
ing tray employed. Inexperienced oper
are precluded from any opportunity of spi
their developer, or pouring it into the ni
bath.

The last advantage to be mentioned is, t
beginner, who has not accustomed himse
the indignity of putting his head under a
cloth (which is not always a pleasant thi
do, when in the streets, or surrounded by
tators), need not learn to do so. The ma
lations are mostly performed without any
ticular personal restraint.

A vote of thanks was accorded to Mr.
come for the description of this intere
camera.

Mr. FORREST exhibited some specime
tinted glass for vignette printing, having
some experiments by painting the glass
then burning the colour in. He had not,
ever, yet been able to get them suffici
dense; but he had no doubt, with a little
care, he should obtain more perfect speci
The same gentleman then read the follo
paper, which will be found to contain
useful and interesting statements as to
chemical changes which certain descrip
of glass undergo under the continued infl
of the sun's rays:—

It is of the greatest importance to the
tical photographer that he know all the c
cal changes which take place in the mat
he uses, and the media through which
ceives the impressions he fixes. Perha
last thing he would think about would b
the glass in the roof of his operating-
would change by the influence of light
thus effect the chemical action of the sen
plate. As a proof of this I now lay befo
society a piece of the ordinary fifteen oz.
glass that has been glazed in a skylight for
years, and you will at once perceive tha
portion exposed to the light has become
ple, and the part covered with the putty r
its original colour: of course all are aware
the nearer you approach the red ray the l
will the operation be before it entirely c

cause of this change in the ordinary sheet s may be traced to the use of common sand soda-ash in the manufacture. To correct colour given to it by the presence of iron in sand, manganese is used; this increases whiteness of the glass at first, but it soon izes by the action of light, and assumes a le hue. To remedy this evil, all the glass photographic rooms should be slightly ed with blue, because it induces rather than edes chemical action on the sensitive sur- . Cobalt produces a blue, and has the ad- tage of not being afterwards affected by the t. Too deep a blue would seriously dimin- the power of the light, and thus overbalance advantages gained in colour. There is ther very important advantage in the use of tinted glass—the features of the sitter are constrained by the power of the light. ry artist must have felt in his experience, t unless he could get perfect repose in the er, the result was sure to prove harsh and natural, in short, be the very opposite of a sing portrait. I have refrained from point- out the advantages to be gained by the of this glass until it has been thoroughly ed by first-class operators, who, one and admit its undoubted merits. From my experience, I can, with the greatest confi- ce, recommend it to your notice.

Ir. KEITH, in corroboration of Mr. Forrest's er, stated, that three years ago he opened a tographic room in Castle Street, the glass d for the purpose being ordinary sixteen oz. ss. The average sitting per day was then seconds, but they gradually became longer, l at last they extended to ten or twelve onds. He had recently had a new room lt of blue glass, on the recommendation of . Newcome, and he could now get pictures in or three seconds. In the formation of his v room he was short of a piece of glass, six in. seven in. long, and he filled the space with a ce of the old glass, which now has a decidedly low tint.

Mr. FORREST observed that photographers re now becoming alive to the importance of s question.*

After some further conversation the meeting journed.

CHORLTON PHOTOGRAPHIC SOCIETY.

the fourth monthly meeting of this Society, ld September 9th, in the Town Hall, Mr. EPWORTH in the chair. The minutes of the evious meeting having been confirmed, Mr. DRAFFIN, the Hon. Sec., read the following per "*On the Collodio-Albumen Process:—*"

No sooner had the practice of the collodion ocess become general than the inconveniences a wet process for outside employment mani- sted themselves, and, consequently, various eans were devised to preserve the sensitive- ss of the plates, and thus avoid the necessity the operator carrying a quantity of chemicals, d being encumbered with an inconvenient nt, under which he may conduct the various necessary operations. The use of deliquescent salts, that is, such as have a strong affinity for water, and which imbibing it from the atmosphere remain in a moist state, was first suggested as a likely plan for accomplishing the end desired, and the nitrates of zinc and ammonia, two of the most deliquescent of their class, were first employed. These were succeeded by the honey or preservative syrup, then by glycerine, and finally by golden syrup, each of which has had, and still has its advocates and supporters, and doubtless many beautiful pictures have been obtained by their use. Still, all of them labour under one serious disadvantage, namely, a liability to the adherence of dust and other extraneous matter, to obviate which various dry processes have been suggested, one of the most successful of which is the invention of M. Taupenot, and the one that in our present state of knowledge is, I think, the most worthy of our attention. As it has already been so frequently and so completely described by others it may almost appear presumptuous on my part to bring it before your notice this evening, especially as I have but little novelty to introduce. In consideration, however, of the numbers who have failed to produce satisfactory results by it, and the comparative success that has attended my own practice, I think it not undesirable to explain my mode of manipulation, as simply as possible, with a hope that those who have abandoned it will renew their efforts, and that those who have been discouraged by blistering of the film and other imperfections, will be stimulated to perseverance and finally to success.

Two or three days before preparing the plates; I make the albumen (according to the formula which I shall afterwards mention). Filter it through a small bit of sponge, then put a small bit of camphor in the bottle to preserve it, and let it stand till wanted for use, by which time it is quite clear. I then decant off as much as is required into a clean vessel, taking care not to let any of the sediment in the bottom of the bottle get into the vessel, I also prefer this plan with the collodion, so far as allowing it to stand two or three nights before using. I do not make my own collodion, for several reasons; I think it much better where a large quantity is not used, to buy three or four ounces at a time; the collodion I use is exceedingly thin, giving a very delicate film, and also very dense, as you will see by the few specimens in the plate-box on the table: this collodion is procured from Mr. Hepworth; I have tried others, but must say there is none I have succeeded so well with for negatives as his.

The next thing to be done is to clean the plate, and I need scarcely say is a very important part. I always like to do this the night before preparing them, and proceed as follows: I select the quantity required, taking care they all fit the dark slide; any of the various means of cleaning may be adopted; my plan is with new plates, to dip a nail-brush in a solution of ammonia and spirits of wine, to scrub both sides of the glass, dip it in water and dry; I use this mixture in consequence of the plates being generally smeared with greasy matter that acids will often fail to remove; plates that

* We first directed attention to this latter subject in giving an ount of Professor Frankland's lectures at the Royal Institu- n. A blue glass will be undoubtedly better than a reddish or ellowish one; but, is not *pure white* glass the best of all? or if e, the tinge should be scarcely perceptible.—ED. L. & M. P. J.

have been previously coated with collodion and albumen must be steeped in a solution of potash or soda for a few hours, then washed and dried as usual. My reason for cleaning the plates the night before I prepare them, is to be rid of *the dust*, the great enemy of this or any other process.

After the plates are cleaned, I stow them away in the grooved box, and when ready for the next operation, place the box near to the fire; I may here observe that I always prepare the plates in the kitchen, because it is warm, and no danger of moisture in the atmosphere, one great cause of blister in my opinion. While the plates are warming I provide myself with three clean bowls, partially filled with clean water; for the sake of distinction I will call these bowls Nos. 1, 2, and 3. I now take out a plate, coat with collodion and sensitize in a positive bath in the usual way; I draw the plate out of the bath and place it face downwards in bowl No. 1; coat another plate, place into the bath, and while there, go on washing gently the plate in bowl No. 1, and then place it in bowl No. 2, face down, draw out the plate that is in the bath, place it in bowl No. 1, as before; coat another plate and put it into the bath, and then proceed to wash plate in No. 2 bowl, and place it in No. 3 bowl, wash the plate in No. 1 and place it in No. 2. I then take out the third plate from the bath, placing it in No. 1 bowl, and put another plate in the bath; the water should be changed as soon as it becomes at all milky—I change it after each half-dozen plates are washed. I take out, after slightly washing, the plate in bowl No. 3, place it on one corner on filtering paper to drain, and proceed in this way till there are six plates draining; I then take the vessel containing the iodized albumen, and pour a small quantity very gently, so as not to *create bubbles*, into a small glass, say a wine glass, and from this glass I coat the sensitized plates, allowing the albumen to flow evenly over the plate twice; then pour off into another vessel; by pouring off into the filter the albumen may be used again the same night if required; as each plate is coated with albumen I place it at once in the oven, which should be moderately hot; the plates should stand on end on bibulous paper, and the oven should be well rubbed all round inside with a cloth some time before commencing, to remove dust and particles. The great thing in this part of the process is to avoid dust on the collodion and albumen coatings; before commencing the former, I take a large camel hair brush and stroke it once or twice over the plate to remove any dust that might adhere to it. So particular am I in this matter that I never commence work till the family have retired, when I have the kitchen to myself. You cannot successfully prepare collodio-albumen plates when other parties are about you agitating the air and keeping the dust in motion. Bubbles in the albumen should be avoided, therefore I never pour the albumen off the plate into the same vessel it came out of, pour it into the filter off the plate, and it will be ready again in case the albumen should fail in quantity.

[A press of matter compels us to postpone the remainder of Mr. Draffin's interesting paper till our next publication.]

During the reading of the paper, Mr. Draf illustrated the same by exhibiting several ve good specimens of negatives taken by the pr cess, and also developed some pictures tak the day previously.

A general discussion then took place on t process; after which the thanks of the meeti were voted to Mr. Draffin for his interesti paper, and to the Chairman, which conclud the business of the evening.

The next meeting will take place on t second Thursday evening in October.

BIRMINGHAM PHOTOGRAPHIC SOCIETY.*

A general meeting of this Society was h on the 25th of August, W. Howell, Esq., the chair.

Mr. Osborn reported that the Council h made arrangements for the following papers be read during the present session:—

August.—The "Waxed Paper Process," the Rev. Mr. Law.

September.—The "Dry Collodion Process," Dr. Hill Norris.

October.—The Annual Meeting, to be follow by a discussion on the vari "Causes of Fading in Posit Prints."

November.—"Photography as applied to and Art purposes, but more es cially to Architecture," by Mr. J. Brown.

December.—Some remarks on the "Posit Collodion Process," by Mr. C. Haines.

Mr. Law in commencing his account of *Waxed Paper Process* said:—It has often occur to me, that if some practised photographer w has gone through any particular process, a met with all its failures and subsequent succ would give the details of his failures, trac each resolutely to its sources, and point thereby the mode of prevention or remedy, would at once produce a paper both hig instructive and entertaining.

The grand secret, Mr. Law continued, of s cess in photographic operations is the disp tion and ability to trace failures to their caus; and I candidly confess, although the confess may savour of uncharitableness, that whe photographer, either an amateur or a p fessional, conceals his failures beneath e assurance of uniform success, I think, either s experience must be very scanty, or his ju ment faulty; his standard of excellence m t be too low, or his aspirations after perfec n have not emerged from the incubus of defec e mental training. . . . .

That the waxed paper process is capabl f great intrinsic excellence of a highly arti c standard, no one who has ever examined an hibition of photographs will deny, but whet r the process is superior to collodion, or whe r the albumen or the calotype excel both, I s ll not now enquire. I have practised all, and is exceedingly difficult to raise a standard of c parison.

Let us now take, *seriatim*, the seven dist ct

* Abstracted from the "Journal of the Birmingham P o-graphic Society."

erations into which the waxed paper process turally divides itself.

I.—THE CHOICE OF THE PAPER.

Good paper, as all photographers are fully vare, is a difficult thing to obtain. Some ars since I found none equal to Canson's gative paper, but from some cause or other is paper is now nearly worthless for photo-aphic purposes. A uniformly fine and even xture, and perfect permeability to the melted ax are absolutely necessary to ensure success. nglish papers, although possessing the former quisite, are all sized with gelatine, which has endency to diminish their sensibility to light d to render their saturation with the wax tremely difficult. Good French paper, care-ly prepared, will yield equally delicate results, sides being much more sensitive. English pers should be manipulated unwaxed, and by e time they are finished they will be found adily permeable to the wax. The advantages hich *English* papers possess over the French e, First, greater fineness of texture. Second, e length of time they may be left in the de-loping solution without discoloration. Third, hen treated as above they will bear a much nger exposure in the camera without solari-tion. The gelatinous matter in their compo-ion has, however, a retarding influence upon eir photographic action, and, therefore, as mpared with French papers, the sensibility is three to two; thus, while English papers ll require fifteen minutes, the French take ly ten minutes. Upon the whole, I prefer e French paper for the waxed paper process. "Papier Rive" I find very certain and regular its action, and tolerably rapid. "Papier xe" is rather thick and about one-fifth slower its action; it is most suitable for architect-al subjects. "Marion's papers" have yielded e most excellent results. They are even in xture and more sensitive than any other I ve yet used. The No. 16 gives very perfect tail, but is rather apt to become granulated over-exposure.

The paper, however, which has proved in my nds the most successful is "Marion's New xtra Sensitive Negative Paper," upon which I ve taken the views and also the portraits I w exhibit—portraits taken in forty seconds, d remarkable for their softness and delicacy.

II.—WAXING THE PAPER.

The kind of wax I prefer for my own use is re virgin bees' wax, and to prepare this I tain the palest portion of the comb before e honey is strained off, and after carefully parating all extraneous matters, I throw the mb into a large quantity of boiling water. hen the water is cold I take off the solid wax om the top, put it into a basin, and thoroughly elt it, taking care that it does not boil; the diment will thus sink to the bottom, and hen the mass is cool, it may be scraped off the ttom of the cake.

The principal object to be obtained is tho-ughly to saturate the paper with wax, and at e same time to take great care that the tem-rature shall never exceed at most about 220° hrenheit, because if the wax *boils*, a change or composition takes place, which renders it most useless for our purpose. I always use a box iron, and after making the heater red hot, I allow it to cool down from a red heat into an invisible (if I may so term it) or black heat; I mean when the last trace of red has vanished. In this state I put it in the box of iron; in a minute or two I apply a piece of wax to the iron; if it bubbles, the iron is too hot, but if it runs down in streams, it is in a fit state for use. It is very important to have the iron perfectly smooth and clean. After many trials, I have found that the best way to clean the iron is by rubbing a piece of wax over the flat part, and then immediately rubbing bright with a handful of thin paper. I then move the iron over the paper to be waxed, and follow it up with a piece of wax until the surface is thoroughly covered. When one paper is waxed another is laid upon it, and the same operation is gone through, one after the other, until a compact block or mass is formed.

The sheets may be separated, when required, by holding the block to the fire, taking care not to let them scorch. I then place each sheet between two thicknesses of bibulous paper, and on passing the iron over them the superfluous wax is absorbed. On examining the sheets they should present a perfectly even and homogenous appearance, when held either against, or diagonally with the light; there should be no patches of extra or lesser transparency. Should such be the case with any of the sheets, they should be at once rejected. This brings us to the next operation.

III.—IODIZING THE PAPER.

To one pint of distilled water (twenty ounces) I add 225 grains of iodide of potassium, 112½ grains of bromide of potassium, a large tea-spoonful of pure honey, and as much free iodine as will give the liquid a deep sherry tint. Having filtered this, I pour sufficient into a flat dish and proceed to immerse the papers in the following manner:—Taking a sheet by the opposite corners, I bend it thus, and lower it on to the liquid quickly. I then, by means of a pair of forceps, take up one corner and raise it, in order to see if any air bubbles are present; should there be any I carefully remove them with a glass rod. I then lower the sheet on the bath, and still holding the corner by the forceps, I pass a glass rod, bent in a triangular form, quickly over the back of the paper; by this means the paper is evenly immersed, and bubbles are avoided. Proceed in the same manner till the dish is full or nearly so. I allow them to soak some time and pin them up to dry.

The papers, when dry, should present an even, uniform, brown, or purple colour. The sheets so prepared will keep any length of time if secluded from the air. When required, they are all ready to be made sensitive.

IV.—THE SENSITIVE BATH.

The strength of the nitrate bath varies with different operators. My own formula is thirty grains of nitrate of silver; thirty minims of glacial acetic acid; one ounce of distilled water. I always endeavour to keep up the strength of my nitrate bath, and after exciting about half-a-dozen sheets I add about thirty-five grains of nitrate of silver, and thirty-five minims of glacial acetic acid to each eight ounces of solution.

The acid I use is true glacial acetic, which solidifies at fifty degrees Fahrenheit. Weak nitrate solutions, as a rule, will not answer the purpose, as they soon become exhausted, and therefore cannot be relied upon.

In rendering the paper sensitive I float and mmerse it in the same way as recommended for iodizing, only exciting one sheet at a time; allow it to remain in the bath until all the brown colour has disappeared, when it may be transferred to a dish of distilled water, and subsequently to a second, if the paper is required to be kept some time. Wax being a repellant of water, it is necessary to blot off all the moisture previous to hanging up to dry, otherwise stains are very apt to make their appearance.

I may here observe that Dr. Keith has established the fact, that by increasing (within certain limits), the strength of the iodizing solution, and therefore the amount of iodide of silver in the paper, it is possible almost to rival the rapidity of collodion. In these cases the sensitive paper is used immediately after the formation of the iodide of silver, and applied to a clean plate of glass when taken out of the silver bath. No washing is required.

With regard to the sensitive bath, my advice is never to prepare a smaller quantity of the solution than sixteen ounces, and never attempt to excite more than one sheet at a time, and be careful to get rid of *bubbles*, the existence of which would necessarily occasion unequal action of the nitrate solution upon the iodized paper, and stains in the developed negative. Wash for about five minutes in two separate baths of distilled water after removing the papers from the exciting bath, each containing about a pint, if they are to be kept over twenty-four hours otherwise one washing for the same time will suffice.

[We are reluctantly compelled to leave over till our next number, the three remaining divisions of this process, together with our remarks on the whole subject, all of which are in type.]

ON PHOTO-LITHOGRAPHY,
AND AN ALLEGED
NEW PROCESS FOR TRANSFERRING THE DAGUERREAN IMAGE TO PAPER.

A CONTEMPORARY commences his "leader" with an announcement of "two important photographic processes." The first being M. Poitevin's process of photo-lithography; the other being erroneously described as "entirely new." That the first process is "important," there can be no doubt in the minds of those who have seen the specimens which we had the honour of placing in Professor Frankland's hands for exhibition at one of his lectures delivered at the Royal Institution, in the early part of the summer. Our contemporary is so far away from the great centres of photography, that he may be excused for having seen only one specimen, "which was *tolerably* good." We have in our possession, and have exhibited a dozen specimens, containing among them the one which is so much eulogised by the French committee, "that which represents some details of the Cathedral at Rheims, and which has been obtained from a fine negative of M. Bisson." We commend this picture to the notice of the Architectural Photographic Association. Wit[h] such a result before them, they may perhap[s] pause before they commit themselves to th[e] patronage of any development process hithert[o] *published* and *tested by time*, however "infallible" it may be declared to be. We are at a loss t[o] understand why these fine photo-lithograph[s] have not been more generally introduced int[o] this country. Is it possible that we hav[e] amongst us those who do not wish to see Her[r] Pretsch's process rivalled, and who consequentl[y] do not care to see or hear spoken off, specimen[s] which, if all that M. Poitevin says of them b[e] true, will, before long, *go far* to supersede ever[y] other means of rendering the negative? The[se] specimens might have been seen at the Ma[n]chester Exhibition, if the director of the photo[]graphic department had used ordinary diligen[ce] in asking for specimens from *those who we[re] likely to possess such*. The view of Rheims [is] considered superior to any *untouched* resu[lt] obtained by any other process in which printer[s'] ink is used. We have seen the images upo[n] the stone, and during the process of copying [by] the light, and it seems to us that the who[le] plan is superior to the engraving processes for [the] majority of purposes, both as regards simplici[ty] and facility of execution. We also think th[at] for many purposes it must be more economica[l]. The chromium salt mixed with albumen, a[p]plied to the stone, is inexpensive, and t[he] treatment after exposure to the light and befo[re] the application of the inking roller, is marve[l]lously simple. M. Edmond Becquerel, who [is] fully acquainted with the details of M. Poit[e]vin's process, assured us that we should [be] surprised at the simplicity of the whole affa[ir], and it was only to give M. Poitevin eve[ry] chance to establish himself before competito[rs] who might, from their commercial position, ha[ve] the means of outstripping the inventor, that [he] abstained from communicating fully what [he] knew upon the subject. We respect this feelin[g] in this case, though, as a rule, we are n[ot] inclined to be very tender towards "secr[et] mongers" in any art or profession. What [is] wanting in photo-lithography and in pho[to-]galvanography, is that delicate gradation [of] tint which we obtain in positives, made u[pon] chloride of silver paper, by the *direct* action [of] the light. No development process that [we] have ever seen, and we take great interest [in] inquiring into this matter, gives that gradat[ion] of tint and transparency in the shadow wh[ich] we find in positives, made upon albumini[zed] paper; and if the balance is to be struck fro[m] consideration of permanency alone, then we th[ink] photo-lithography will bear away the palm.

For *extreme* delicacy and permanency not[hing] has surpassed Fizeau's Daguerreotype etchi[ngs].

And this reminds us that we have to re[mark] upon the new process for transferring the Dag[uer]reotype image to paper, which essentially is [not] new.

Mr. Belfield Lefevre, who, it is just to [say], writes with "much diffidence," directs that [we] shall,

1st.—Dissolve one part of gelatine and [one] part of golden syrup [the best molasses] in [one] part of boiling water, and pour out the hot so[lu]tion in a shallow pan.

2nd.—Float for a few minutes on the hot solu-
on a sheet of Hollingsworth's thin negative
iper, previously well dried.

3rd.—Draw off the paper, holding it vertically
, a short distance from the fire until the super-
)undant liquid has ceased to drain off.

4th.—Lay it out horizontally on a cold slab
ıtil the gelatine has firmly set.

5th.—Meanwhile take the image to be trans-
rred fresh from the mercury box, and having
ashed it, first in the solution of hyposulphite,
ıd then in water, put it on end to drain until
ıe formation of the horizontal water-line marks
ıat the liquid on the surface is reduced to a
ere film.

6th.—Lay the gelatine paper on the image,
·essing it down firmly and evenly with a soft
oth until it is brought at every point in perfect
)ntact with the surface of the metal.

7th.—After a few minutes, peel off the paper.
)me caution will be required, as it will be found
adhere rather firmly.

If the proof has been well selected, and the
anipulation is successful, every particle of re-
ıced silver will be found transferred to the sur-
ce of the gelatine, and a faint vestige of the
·iginal image will alone be traced on the black
ıd polished surface of the silver.

On examining the transferred image by re-
ɔcted light, it will appear as a faint and some-
hat shadowy transcript of the original drawing,
which a careful inspection, in a favourable
ght, will detect many details re-produced with
·eat sharpness and delicacy. By transmitted
ght, however, the semi-transparent nature of
etallic films, of extreme tenuity, will be found
ıinfully evident. It is indeed a faint negative,
ıt it differs from those obtained by ordinary
·ocesses, in two most important particulars.
the first place, its lights are perfectly and
)solutely pure; and in the second, its half tints,
)wever faint, are represented by a metallic
ıuivalent really and substantially existing upon
ıe surface of the gelatine, and which, therefore,
ay become the basis of chemical action,
though too minute to be detected by the most
ıreful inspection. The colour of the metallic
.m varies greatly, generally approaching to a
ddish brown where it is most dense. This
early points out a fact for which we should
ırdly have been prepared, viz., that the high
ghts in Daguerre's image are in reality formed
two distinct layers, the upper stratum being
anched by the action of the mercury, and pro-
ıbly amalgamated with it, whilst the lower
tains the reddish hue which reduced silver
metimes assumes. The rosy tint which is
)servable in the high lights of the finest proofs,
hen seen obliquely, is thus explained. Con-
dered as a basis of chemical action, the trans-
rred image is a sheet of gelatine, on which
ırticles of pure silver, or of silver amalgam, are
ore or less densely strewn. To increase the
)acity of these particles, so as to render them
ss permeable to the rays of transmitted light,
a problem for the solution of which three
ethods are open. Firstly, to transform the
etallic particles into some binary compound.
econdly, to substitute for them their chemical
ıuivalents of platinum or gold: and Thirdly,
render them the centre of a catalytic action,
which shall group around them fresh molecules
of reduced silver. No great difficulty is to be
apprehended in carrying out these suggestions.

The transferring of the Daguerrean image by
means of gelatine, was accomplished many
years since by a Mr. Edwards, and published in,
if we mistake not, the *Mechanics' Magazine.* We
now have in our possession, a view of part of
St. Martin's Church, Trafalgar-square, so trans-
ferred to *black paper*; and we long ago held a
conversation with Mr. Edwards upon the sub-
ject; but the faintness of the image, and the
non-success of the few experiments which were
tried to strengthen it, caused the process to fall
into oblivion. We recommended the use of this
process as a means of studying the Daguerrean
image, in one of the lectures we gave at the
Royal Institution last year. So much for the
novelty of this subject. And now, in behalf of
the interests of photography, may we be allowed
to ask Mr. Sutton to be less confident in his
assertions respecting the "novelty," "utility,"
"permanency," &c., of the various processes
that happen to come into his hands. One loses
all reliance when one finds a writer frequently
erring in this respect, and at last photography
itself indirectly suffers. We have hitherto,
generally allowed such statements to pass un-
corrected; but, for the future, we shall make it
our *mission* to tabulate, from time to time, the
erroneous statements which we meet with in
the course of our reading, especially as regards
the past history of photography. M.

ON OBTAINING PURE WHITES ON ALBUMINIZED PAPER.

MR. TUNNY has, in answer to an enquiry in *Photographic Notes*, given one of the best ac-
counts of the preparation of albuminized paper that we have seen. He says, "I always prepare
my albuminized paper with the pure white of eggs, which I believe to be preferable to all the
cheaper compounds that have been substituted for it. Take any quantity of albumen with
double the quantity of water, adding eight grains of chloride of ammonium to each ounce
of the mixture. Whip up with a bunch of quills into a froth. The albumen will subside
in an hour or two, then filter through a piece of fine linen cloth that has been previously slightly
singed over a spirit lamp. Pour the albumen into a flat dish and float the paper for about
three or four minutes, having previously folded back one of the corners of the sheet in order to
keep it from coming into contact with the albumen. If the paper is pinned up by this un-
albuminized corner, it will dry without the least streak or imperfection, but if the albumen
comes into contact with the pin a drip will begin which will end in innumerable streaks.
By this precaution much paper may be saved.

"The albumen containing the above amount of chloride requires about sixty-five or seventy
grains of silver to render it sensitive. I print in the usual way, a little deeper than the
finished print.

"The print when taken from the printing frame is thoroughly washed from all free nitrate
of silver. Make certain of this, to make the fixing process as economical as possible, which
should not be expensive if carefully done. The

washed print is put into a chloride of gold bath, two grains to five ounces of water. In this bath the picture will readily change colour and slightly lower in tone. After it is reduced to the required tone it is passed through water, then placed into a new hypo-bath—four ounces to ten ounces of water. The print will be perfectly fixed in fifteen minutes. Taken from this bath it is repeatedly washed with cold water, then thoroughly with boiling water. The French and German papers get from fifteen to twenty waters, the English papers part more readily with the size, and consequently fewer washings are necessary to fix the prints on it.

"In order to secure perfect whiteness it is essential not to use the hypo bath when above a day old. The whole secret of retaining the clearness of the whites, being in always using a new strong pure hypo bath. By the above process I never fail in obtaining the whites pure.

"I may mention a curious circumstance of hyposulphite of soda. In some I got lately every picture that I fixed possessed that yellow old cheese-like appearance that has been so often complained of, while another sample of hypo gave me prints of absolute whiteness. In testing the solvent powers of these two I found that the first possessed only the half of the solvent power of the latter, viz.;—it took double the quantity to dissolve twenty grains of chloride of silver in a given quantity of water. Whether the soda possessed other impurities I have been unable to detect."

[With regard to this latter subject we want an "*Analytical Commission.*"—Ed. L. & M. P. J.]

AMATEURS' COLUMN.

Paper for Photography.—The sheets, after their final removal from the pack, are hung across horse-hair lines to dry; from three to five sheets being suspended together, consequently two only are freely exposed to the atmosphere. How far this condition of things may influence the result I am unable to say. It will also be observed that one sheet is in contact with the horse-hair line, which accordingly leaves a mark across the centre of the surface of all sheets so situated. These marks, however, disappear to the eye during the carrying on of the subsequent operations. The dry paper, still bibulous, is now quite ready for sizing.

On my first visit to Kent, where the experiments were carried on, I made many enquiries about the materials used in sizing, and also about the amount of boiling to which such materials were submitted; for I knew that the animal tissues and fibres which were capable of yielding a gelatinous size, were also capable of furnishing a different product on the long application of a high temperature. At Hollingsworth's, formerly "Whatman's Turkey Mill," I learnt that the hoofs and feet of animals, in a fresh or green condition, were preferred to the dried skins and "pates" commonly employed. The process was to keep such fresh materials for some days in running water to cleanse them, then they were *carefully* boiled with water, keeping the temperature down as much as possible. The liquid thus obtained was allowed to settle and cool, when the fat would be found on the surface, and the heavy impurities at the bottom of the mass, the intermediate portion being a firm well-looking jelly. This jelly is diluted with hot water to a consistence ascertained by experience, and judged of empirically by its apparent viscidity. Alum, in lump, is then added to the warm jelly in varying proportions. On this point we had no experience. The paper-maker, therefore, added as much as he thought would produce a hard resisting size. The addition of alum in great quantity causes the paper to have a "rattle" on suddenly pulling the opposite corners of a sheet held loosely and diagonally. And as the buyers are supposed to be pleased with this rattle, as affording evidence of the firmness of the fabric, the paper often gets more alum than the conditions for perfect sizing demand. The alum is found to vary very much in quality, but the best kind is of course to be selected. The size, then, consists simply of animal jelly (which is an imperfectly understood substance or mixture of substances) and alum. Coarser sizing materials may contain lime or salt, but these are avoided by good paper-makers. The lime, when present, has been used to remove hair from the skins, and the salt to check putrefaction. This, one thing is certain, that the best paper ever made for the Talbotype process was made at "Turkey Mill," where the size is prepared as above related. This paper, ream by ream, gave, as a rule, fine close black negatives; and it could be made sensitive over night with much stronger solutions of gallo-nitrate than are now recommended. The development could be deferred until the same hour the next night. It could fully be depended upon for twenty-four hours even, be it remembered, when washed over with comparatively strong solutions of gallo-nitrate.

This paper was used successfully by the Rev. Calvert Jones, about 1844, at Malta, in very hot weather, and also in the East by the Rev. Mr. Bridges. It is strange to relate that such paper has *never* been obtained since, even from the same mill, and that is why I dwell so much upon it at this moment. Could we get such paper again with certainty the Talbotype would take a new start. The only thing that could compete with it would be the transfer process applied to collodion, but that will always be a delicate, if not a difficult operation for the amateur to perform *while on a tour.* I trust these "jottings" of mine may assist in bringing about a good process for the manufacture and preparation of photographic paper, for it is certain that at present all the paper makers are working in the dark as far as principles are concerned. Cansons, the French makers, are, I am told by Dr. Warren de la Rue, noted for the insolubility of their paper-size, but unfortunately for us they will not disclose their process, consequently there can be no interchange of ideas between chemical photographers and themselves.

COLOURING OF COLLODION POSITIVES.

Those of our correspondents who are interested in this subject may make trial of either the gelatinous or the resinous coating described by a correspondent of the *Journal of the London*

'hotographic Society. The process is said to be asy, and will, with a little care and trouble, roduce a "first-rate" effect.

I. Take ten grains of isinglass, dissolve in an unce of warm water, and filter the solution; our this still warm on the portrait, after well rashing from the cyanide; let it dry by the re, then breathe on it a little, and it will take ie colour. The usual powder colours being mployed. The picture may afterwards be arnished.

II. Into a wide-mouthed bottle put a little anada balsam, pour on some spirits of turpentine nd let all stand a day or two, occasionally iaking the mixture. Add ten or fifteen drops f this to one ounce of spirits of turpentine in nother bottle, well mix and filter through lotting-paper; pour this on like collodion; id thus varnished, let the plate dry before a ear fire, which will take a few minutes. For picture intended to be *highly* coloured nothing in be better than the above; but it will quire care, as the colour bites deep: if too uch so add more turpentine.

Will any of our correspondents kindly favour s with *their* experience in tinting positives on lass, or with the result of their trials of the oove substances? Much must depend upon otaining *pure and rich* colours in *very fine* owder. It occurs to us to add that purified gall may be of service where anything like easiness of surface occurs.—Ed. L. & M.P.J.

Fulminating Silver.—This substance was scovered by Berthollet, in 1788. It may be rmed by dissolving very pure silver in nitric id, and then precipitating it by lime water. ie precipitate is put upon filtering paper, hich absorbs the water and the nitrate of lime ith which it was mixed; then pure liquid amonia is poured upon it, and allowed to remain r twelve hours: it is then decanted off, and e black powder on which it stood is placed utiously and in very small portions upon bits filtering paper. This powder is fulminating ver, and while moist explodes with violence, struck by a hard body. When dry the slightest uch is sufficient to cause it to fulminate. When e liquid decanted off this powder is heated in a ass retort an effervescence takes place, nitrogen s is emitted, and small crystals make their aparance, which are opaque, and have a metallic illiancy; these fulminate when touched, even ough covered by the liquid, and often break pieces the vessels in which they are kept.—*rthollet Ann. de Chim.* i. 54.

Fulminating Gold.—Dissolve pure gold in ro-muriatic acid, diluting the solution with rice its weight of water, and then drop in re ammonia, by little and little, as long as any ecipitate is formed, taking care not to add too ich, because in that case part of the precipie is again dissolved. The precipitate, which of a yellow colour, is to be washed in pure iter, dried slowly upon filtering paper, and then t into a phial, which, to prevent accidents, ght not to be corked, but have its mouth vered with a linen rag or a slip of paper. is powder is fulminating gold. Its preparation described by Basil Valentine, and its singular properties excited the attention of all succeeding chemists. It explodes when struck violently, or when triturated in a mortar, or when heated to about 400° Fahr. The noise is tremendous, and when in any considerable quantity (twelve grains for instance) it lacerates the metallic plate on which it is placed.

MR. SUTTON'S CHALLENGE.

The following letter, which has been addressed to the editor of the *London Photographic Journal*, needs, at present, no comment:—

Royal Square, Jersey, Aug. 11, 1857.

Sir,—By this post you will receive three photographs, purchased by me of Mr. Sutton, and, no doubt printed and mounted at the establishment of Blanquart-Evrard.

In the last number of *Photographic Notes*, edited by Mr. Sutton, is a paragraph as follows:—

"All Blanquart-Evrard's prints have been mounted with starch. As I have repeatedly challenged the world to produce a faded print from that gentleman's establishment, without receiving any reply, we may conclude, without theorizing on the subject, that starch is a perfectly safe cement to employ for mounting positives.—[Ed. P. N.]"

Now, Sir, that the three photographs above named, and sent herewith, *have* faded, and that very much, there cannot be a doubt; but, when I tell you that they have been shown by me to Mr. Sutton some months ago, and that he of course could not but acknowledge the fact of their having faded, you will, I am sure, equally with myself, be astounded at the mendacity of the assertion—that the world has been *repeatedly* challenged to produce a faded print from Blanquart-Evrard's establishment, and *without reply*. Will Mr. Sutton have the kindness to say when and where the challenge has *ever* before been given?

If Mr. Sutton desires another proof of the want of permanence in what he calls "the permanent process," he can be supplied with the article in the shape of a photograph of rocks (a fellow-print to one of those sent herewith), to be had of his printer of the *Notes*, where such view is exposed to-day (Aug. 11th) for sale on Mr. Sutton's behalf; and, as it is the only photograph in the shop-window, the fact of its having faded seems to establish a somewhat singular contradiction of his assertion regarding the permanence of the prints in question.

I think Mr. Sutton cannot reasonably complain of the challenge so publicly given, and so repeatedly (?), being at last as publicly responded to; and I would beg to remark that, as I have the honour to be a photographer myself, I have therefore a kind of compunction in acknowledging that photographs in any case may or do fade. This, however, is tempered with the satisfaction of knowing, that, although the prints may *not* come from the establishment of Messrs. Sutton & Blanquart-Evrard, it is quite possible that they may stand the test of time as well as those that do; and really think Mr. Sutton a little too arrogant when he asserts, that *the future of photography depends upon the success of the printing establishment in St. Brelade's Bay, Jersey*.

HENRY MULLINS.

ANSWERS TO CORRESPONDENTS.

J. Lake.—See Mr. Tunny's process in the present number. Follow that *exactly*, and you will not get the bad result you complain of.

B. K.—1. The *best distance* at which to place the cameras for stereoscopic views cannot be dictated except in the presence of the scene. It is a matter requiring great judgment, as we have already said. The separation must increase with your distance from the chief object. The angle formed by the

lines which proceed from the centres of the lenses to some given point in the chief object is to be the guide; 18° has been used for a statue; 15° is preferred by some, and we have, to be within bounds, said use from 5° to 10°. There is no fixed rule when taking an assemblage of objects which are at different distances from the camera. The old golden rule of keeping the mean is still a golden rule here.—2. Distance can be taken by the wax paper process, but the paper must be very good.—3. See the wax paper process given to-day.—4. The right time of exposure, and care in applying plenty of gallic acid at the last moment, influence the colour of the deposit.—5. It does not follow: we like to see clean negatives; and fine results are also got from negatives which, on the surface, appear to be worthless.—6. S e answer to J. Lake.—7. We have no information beyond that given in the original memoir. We presume that the ironing is to be dispensed with in the preparation of the paper.—Finally. Be assured your questions are not of a nature to "impose upon" our "patience."

CONTENTS.

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THE LIVERPOOL & MANCHESTER

Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

EW SERIES.] No. 20.—OCTOBER 15, 1857. [Price 3d. Stamped 4d.

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The
Liverpool & Manchester Photographic Journal.

New Series. No. 20.—OCTOBER 15, 1857.

Since the remarks on Paper for Photography, contained in our Amateurs' Column were written, we have re-visited some of the principal paper mills in the neighbourhood of Maidstone, in Kent, and we are glad to be able to say that there is some chance that we shall before long have greater attention paid to papers intended for photographic purposes. We think we may say that some of the chief makers now admit that they have not of late paid that attention to the subject which its requirements demand. We were told that "the public will have a cheap article and that they must take the consequences." An admission was very generally made that the paper of to-day is often inferior to paper made before the introduction of the penny postage system. The great demand for cheap papers has caused a gradual alteration, for the worse, in the general process of manufacture. Persons of all grades, and long connected with the paper mills, agree as to that. We were so far gratified at having our own remarks confirmed. What we first want is to return to the best of the old methods and carry it out with increased care, then let us see how we can improve upon that method. The rags require sorting with greater care, and the boiling in alkali, *now* acknowledged to be one of the most essential parts of the process, thoroughly done. The bleaching by chloride of lime to be set aside for the old plan of using *chlorine water:* or let the stuff be used unbleached as is now done for paper for certain *national records.* From what we have learnt we are more than ever inclined to think that the free use of chloride of lime is prejudicial to paper for positives. We would say use unbleached stuff, but we are met with the objection that paper will never be "clean" unless highly bleached. As to this objection we may observe that even good paper makers do not agree amongst themselves as to what is or is not possible or desirable in the manufacture of clean, strong, uniform, hard-sized paper. Hollingworth's, at Turkey Mill, now size machine-made papers with gelatine, and, as other makers admit, with wonderful success. Still there is a doubt—outside of Turkey Mill—as to whether any machine-made or machine-sized paper can equal vat or hand-made and sized paper. The vatmen are said to shake the stuff together better than the machine. The machine men reply, "a man tires of his work, a machine never does." The vatmen answer, "until a man is tired his work is better than machine work." Thus they dispute on many points besides this. The "length" and wetness of the stuff, the number of the holes to the inch best for the wire gauze of the mould and so on. The truth is, the subject is beset with difficulties. Is all linen better than all cotton, or is a mixture allowable? the latter being preferred by the makers. Should the stuff be long with forty wires to the inch in the mould, or very short with fifty, or, if possible, sixty wires to the inch? These are all questions of importance, and beset with special technical difficulties. Who is to pay for the experiments? is asked. We are busy enough as it is, is observed. Will you order 2000 reams? is playfully asked. To attend to you would stop our works. Such are the obstacles, real or pretended, which lie in the path of enquirers like ourselves. We are not easily daunted when once we have made up our mind to carry a plan, and accordingly we met all rebuffs in as decided and good humoured a manner as they were offered, and the result was we have promises of improvement in certain particulars. We have specimens sized and unsized, linen and cotton, bleached and unbleached, with a promise of samples of all the materials used, and specimens taken at every stage of the manufacture, all with a view of tracing out the various elements of failure which may creep in at various points. We are glad to have accomplished so much; and we gratefully acknowledge the tone of liberality which is now evinced, as contrasted with the state of things nine years ago. Still what a work is this! But we will endeavour, as leisure permits, to throw light upon certain obscure parts, though we cannot promise to follow the subject to a perfect conclusion.

We had the intention to offer some remarks upon the fading of positives, arising out of our paper enquiries, but we have not space to-day. We have also to make some remarks upon our views regarding the collection of papers which we print, with a view to *future reference.* A *few* of our readers do not appear to understand our object, or are indifferent to it. We beg most respectfully to ask such to remember that we have various tastes to please, our own included; and, without asserting undue independence, we may add, that we will hold the pen no longer than we can use it unfettered by anything more restraining than *friendly* criticism and advice. Our aim is not a selfish one, as we shall have, we trust, many opportunities yet of showing.

Liverpool Photographic Society.—The next meeting of this Society will be held on Tuesday evening, the 20th inst. Mr. Forrest will read a paper upon "Photography on Glass, Porcelain, &c., with an account of various experiments in burning in and enamelling photographs," &c., &c.

SPECIFICATION OF MR. J. PERRY'S PATENTED PRINTING PROCESSES.

In accordance with our plan of making this journal a repertory of photographic patents, we publish Mr. Perry's specification, notwithstanding its having already appeared in *Photographic Notes.*

In pursuance of the conditions of the Letters Patent, filed by the said John Perry, in the Great Seal Patent Office, on the 26th of February, 1857.

"My invention consists of certain processes, whereby photographic images or pictures may be obtained, which will be absolutely permanent and insensible to the action of solar light.

"I may here state, that my invention relates to the preparation of what are known as 'positive' photographic pictures, such pictures being obtained or printed by the operation of the solar light, from 'negative' pictures previously obtained on glass or other suitable material, in the manner well known to persons conversant with photography.

"In the first instance, I prepare the paper or other material to be used by floating it on a saturated solution of chromate of ammonia or bi-chromate of potash. The paper or other material having been then dried, may be used for printing from the 'negative' picture in the ordinary way, and the 'positive' impression or picture having been thus obtained, I thoroughly soak and wash the same in pure water, in order to dissolve and remove the chromium from the high lights of the picture. The picture having been sufficiently washed, I then dip the paper or other material in a solution of proto-sulphate of iron, and having allowed it to remain a few minutes, I again subject the picture to washing and soaking in pure water, and then pour on the same a small quantity of gallic acid or pyrogallic acid, or tannin in solution, which immediately combines with the iron already existing in the shadows of the picture, and produces the depth of tone or colour required, or should the colour of the picture be unsatisfactory, it can be modified at pleasure by the use of a weak solution of any of the alkalies or acids.

"In the preparation of the paper or other material, I do not, however, confine myself to the use of the chromate of ammonia or bi-chromate of potash, but occasionally use other combinations of chromium, inasmuch as any of the combinations of chromium or chromic acid with soda, silver, tin, lead, zinc, bismuth, iron, cadmium, antimony, and nickel, may be employed for the like purposes, and will produce the like results.

"In some cases I use the chromate of iron in the preparation of the paper or other material, in which cases, after the processes of printing and washing have been effected, the picture is ready at once for the application of the gallic acid or pyrogallic acid, or tannin, whereby the process is in some degree shortened and simplified.

"In some instances, and where great strength or depth of colour is desired, I apply solutions of any of the soluble salts of silver, tin, lead, zinc, cadmium, antimony, nickel, or bismuth, or any of the same combined with ammonia, to the paper or other material previous to the application of the chromium.

"I may here state, that I do not profess to confine myself exclusively to the use of the proto-sulphate of iron, after the application the chromium to the paper or other material, order to produce change of tone or modificati of colour, but occasionally use other compoun of iron, namely, the acetate, nitrate, tartrat citrate, oxalate, chloride, or phosphate, for su purposes; and in some instances I employ, the same stage of the process, any of the sa of silver, copper, tin, lead, zinc, cadmium, an mony, nickel, or bismuth, for the like purpos In some cases also I employ the acetate, oxala tartrate, or citrate of iron, or either of such sa combined with ammonia without the chromiu but in conjunction with the subsequent use tannin, or gallic acid, or pyrogallic acid. order also to produce colour and to improve t general effect of the pictures, I sometimes u cyanogen and other analogous articles used dyeing, and which I apply to the paper or oth material, in the manner herein-before mention with reference to tannin, gallic acid, or pyı gallic acid.

"The processes herein-before described a applicable to paper, linen, cotton, metallic su faces, and wood. In cases in which paper employed, I sometimes prepare the surfa thereof with gelatine or size, in the mann already understood, previous to the applicati of the chromium, as, by so doing, the picture w be retained more on the surface, and a remai able depth and brilliancy of tone will be obtain

"The peculiar advantage of my inventi consists in the great durability or permanen of the pictures obtained by means of the p cesses herein-before detailed, and in the trifli cost at which such pictures can be produced.

"Having now described and particula ascertained the nature of my said improvemen and the manner in which they are to be appli and used, I would observe, in conclusi that I do not confine or restrict myself to t precise details or arrangements which I ha described or referred to, inasmuch as variati may be made therefrom, and chemical equi lents employed or used instead, or in the pl of the substances and compounds herein-bef mentioned, or some of them, without deviati or departing from the principles or main featu of the said invention; and I wish it to distinctly understood that what I consider to novel and original, and therefore claim as invention secured to me by the herein-before part recited Letters Patent, is,—

"Firstly, the use of chromic acid, or any f the combinations of chromium, as a mordant mordants in photographic printing, for the fi tion of iron or other metallic bodies here before in that behalf mentioned, in conjunc with tannin, gallic acid, or pyrogallic acid any compound or compounds containing same, or any mere chemical equivalents ther

"And, secondly, the employment of acetate or other salts of iron, herein-bef mentioned, with or without the use of chromi in the production of photographic images pictures, when used in connection with subsequent application of tannin, gallic a or pyrogallic acid to the paper or other mate employed, as herein-before described, or mere chemical equivalent or equivalents ther

"JOHN PERRY.

AMATEURS' COLUMN.

Paper for Photography.—To return to our izing operation: the paper is put into an ob-ɔng vat containing the warm size, a few sheets t a time, until a considerable mass has been nmersed. A flat board, placed perpendicularly ı the vat is then forced up against the mass f sheets, which are also on their edges, to queeze the whole into close contact; the xcess of size is then run off and the mass of heets removed ready to be pressed, the ad-ering gelatine, now beginning to solidify, being rst scraped away. After undergoing a mode-ıte pressure the sheets are parted, and again ung across the horse-hair lines to dry. As efore from three to five sheets are suspended ɔgether, and the previous remarks respecting ıe conditions under which the sheets dry pply here also. This drying stage of the ıanufacture is a very important one. If the ıoisture is removed too rapidly, as by fire heat, r in very hot and dry weather, the sizing fails, s may be discovered by dipping a sheet so ried into water. This test will show that the ıper is still absorbent over the greater part of s surface, and consequently useless for either riting or photographic purposes. In frosty eather the sizing is also likely to fail, but from hat cause does not clearly appear. In very ımp weather, long continued, failures occur ːobably from the gelatine undergoing a species ˈdecomposition. Again, during thunder-storms ıe paper sometimes suffers injury, as shewn by ıe water test.

From these statements it will be perceived ıat the sizing is a very delicate and uncertain ɔeration, and yet probably our ultimate success ːpends *chiefly* upon this stage of the process ːing well got over. One can now see why ıachine-made papers escape many of the diffi-ılties which attend those of hand-make, and ıe would be inclined to recommend the use of .e machine for photographic purposes, did we ɔt know that as a rule machine-made papers e liable to be more spongy in their texture, rough the difficulty of imitating by a machine e felting "shake" of a hand-workman. Be-des in machine-made papers a different sizing ixture is generally adopted, which interferes ith the keeping qualities of the sensitive paper. lour and resin, or a resin soap with flour, and ith or without alum, is said to be used, each aker having a formula of his own. These aterials appear to aid sensibility, for it should observed that the "Turkey Mill" paper ready spoken of was less rapid than the French ıpers which appear all to be machine-made. we could once get well made sheets from a ıiform pulp, we might soon learn the influence the sizing materials, and devise a method of ɔmbining all the known good qualities, unless deed sensibility and long-keeping are incom-ıtible qualities. On this point we have not ıough evidence. All analogies drawn from the ıse of the Daguerreotype are likely to be llacious.

The paper, after being suspended for a week ten days, may be removed and pressed, and ıen hot-pressed or glazed by being placed ːtween polished copper or zinc plates, or ːtween glazed mill-boards, several of which are passed at once, and repeatedly, between rollers, which exert a powerful pressure upon the surface of the mass which is drawn through them. The amount of glaze depends chiefly upon the number of times the mass is sent through the rollers. If the pressure exerted be extreme, the paper appears full of pin holes, occasioned, I think, by the crushing of the lumps, which we have seen must be formed in the couching operation; and this was the evil I alluded to as being made evident at a later stage of the process. I believe these crushed parts will absorb and be acted upon differently at every stage of the photographic operations; and I doubt very much the policy of very high glazing. I think hot-pressing should be chiefly relied upon; but we want exact experiments upon these points.

We have now gone through the operations necessary to the production of a sheet of paper fit for photographic purposes; and do not let it be forgotten that paper has been made, of good quality, by the process I have described. We want first of all simply to study well the present method, endeavouring to reform it at those points I have indicated as being doubtful. Let us once obtain, *with certainty*, a paper equal to the *old* "Turkey Mill" specimens, and much will have been accomplished. Further improvements would then soon follow.

I have only to state that our linen paper passed through all the stages satisfactorily until it came to the sizing, here it totally failed. It *resisted the size*, although repeatedly dipped and dried between each dipping. The strength of the size was varied, and the dippings continued until the paper became *size-stained*, and yet, on finally testing it by immersion in water, it was found to be bibulous over the greater part of its surface. I now saw how unwise I was in permitting myself to be over-ruled with regard to the *boiling in alkali* at the first stage. I have no doubt that such boiling would remove the resin or gum-resin, or *fatty* or glutinous substance, whichever it may be, that belongs to the *woody fibre*, but which is quite distinct from the *cellulose*, of which the flax fibre chiefly consists. I may add, that a small portion of a sheet which seemed to take the size better than the rest, was iodized, prepared, and exposed in the camera; it gave a very characteristic result, and shewed clearly that flax might be made to yield a paper having every good quality that we could desire. So far the experiment was not an entire loss, although it failed for immediate practical purposes.

In the next number I shall have a few miscellaneous remarks and suggestions to make, after which we shall see how we can best proceed to render paper sensitive for the purposes of positive printing. M.

ON THE PREPARATION OF PYROXYLINE FOR COLLODION.

By T. F. Hardwich, Esq.

[Continued from p. 196.]

"The investigation on pyroxyline reported in my last paper, has since been continued with very encouraging results. The theory of the whole subject will soon, it is hoped, be established on a satisfactory basis. Variations of temperature, and of the actinic force, must

always be a cause of uncertainty in photographic processes; but as far as the sensitive collodion film itself is concerned, the exact conditions of uniformity ought to be ascertainable by a sufficiently minute examination.

"It may perhaps be as well to state, that I lay no exclusive claim to originality in these papers. My object has been to work out the subject practically, and in an independent manner, availing myself at the same time of any information, published or otherwise, which I have been able to obtain The principal points on which I wish to lay stress are two in number, viz., the substitution of linen for paper, as a more uniform material, and the employment of a nitrosulphuric acid containing a larger quantity of diluted sulphuric acid than that given in the first of the two formulæ recommended by Mr. Hadow. Linen is chosen in preference to flax, from its having undergone a favourable modification in the process of manufacture, and the formula for the nitrosulphuric acid is changed in consequence of the diluted oil of vitriol being found to assist in condensing the fibre, and producing a limpid and structureless collodion. If the plan now proposed be followed, double the usual quantity of pyroxyline may be introduced into the collodion without making it viscid, and the film will not readily slip from the glass, or allow the fixing solution to work underneath.

"Many other advantages of employing such a collodion may be enumerated; the film being short and non-contractile is well fitted for the oxymel and dry collodion processes, and for the same reason allows a long exposure in the camera without drying up. The developing solution runs freely, and quite to the edge. Line engravings are copied with considerable definition, the image retaining much of its positive aspect by reflected light, and presenting an appearance altogether different from that given by a tenacious collodion made from cotton-wool.

"On the other hand, it must be confessed that there are some defects. Unless the temperature of the nitro-sulphuric acid be kept within due bounds, the pyroxyline will produce a collodion which liberates iodine quickly, and gives (with a short focus lens of full aperture, and in a strong light) an image of excessive density and of less half-tone than usual. This will be seen likewise on iodizing with an alkaline iodide and keeping for a time. The collodion then becomes very brown, and can scarcely be used successfully for portraits. In a weak light it will fail to give the dark parts of the picture, unless by a prolonged exposure.

"Although it does not invariably follow that collodion from linen pyroxyline gives a more dense negative image than that from cotton, yet commonly such is the case. Neglecting, for the present, the consideration of particular causes which interfere with the proper development of the image on any collodion, and taking for granted the assertion often made, that the condition of the pyroxyline has much to do with the intensity, I proceed to detail some experiments performed with a view of elucidating this point. In conducting them I availed myself of a suggestion of my friend Mr. Pollock, and precipitated the plain collodion with distilled water, in order to test for the presence of a soluble bitter matter which he had discovered. On treating several different samples of collodion in the same way, I found a trace in all, even in that made from cotton; but in the intense collodion prepared from linen a much larger quantity. The same bitter substance may be detected in linen pyroxyline, which is in a fragmentary state from partial solution in the nitro-sulphuric acid. On taking the pieces out of the mixture, washing gently, and laying them on the tongue, the acid taste is succeeded by a strong bitter, like that of nitro-glucose, to which this body is probably closely analogous.

"Since, therefore, the pyroxyline in these intense samples of linen collodion is not in a chemically pure state, but associated with minute quantities of a soluble substance, it seems reasonable to suppose that the development of the image may be affected thereby. There is, indeed, a peculiar creaminess, or 'bloom,' as some would call it, upon the plate, such as certain kinds of organic matter, in conjunction with a strong light, will produce.

"The pyroxyline made from linen, at rathe a high temperature, and with an excess o sulphuric acid, seems in other respects also t possess properties intermediate between thos of the ordinary soluble cotton and nitro-glucos In addition to the sparing solubility in wate mentioned above and the strong bitter taste, observe that, when first treated with the ethe it sinks down to a soft and sticky mass, no easily removable from the bottom of the vesse and often admitting of being kneaded in th fingers like a soft resin.

"This probably explains why the film is s adherent to the glass. In Taupenot's proces for instance, I have found the use of a sho collodion made from linen to be an almost ce tain remedy for blisters; it resists the draggin action of the albumen, and rarely separate especially when it has been kept a long tin after iodizing with iodide of potassium or an monium. I have also laid two samples of co lodion, differently prepared, upon the same glas covering both with albumen, and found that o blistered whilst the other did not. I thin therefore, that the explanation which refers t source of annoyance principally to a faulty sta of the collodion is in the main correct, althou other causes may be concerned in producing

"Another point to which my attention h been lately drawn, is the variable rapidity wi which different samples of plain collodion li rate iodine on adding the alcoholic solution iodide of potassium. This question, like m other points in photography, is a complex o as the state of the ether, the reaction of t collodion to litmus, and the length of time t plain collodion has been kept, must all taken into account. There is, however, a culiar condition of the pyroxyline itself, hitherto noticed, in which although all tra of acid have been removed by washing in we ammonia, and the plain collodion possesses faintly alkaline reaction, yet a rapid colourat occurs on adding iodide of potassium. I ha found the above state to be produced by leav

paper in nitro-sulphuric acid for a long time, ;ay from twelve to twenty-four hours, and also)y making linen pyroxyline at a very high ,emperature, and with an excess of the diluted ulphuric acid. To prove further that the action of sulphuric acid was one means of producing this state, sheets of blotting-paper were loated upon oil of vitriol mixed with half its bulk of water, for variable periods of time, and subsequently made into pyroxyline at a low temperature; the result was that the paper, simply floated upon the acid and removed immediately, produced a collodion which remained nearly colourless on iodizing; whilst that which had remained in contact with the oil of vitriol until a very strong contraction had taken place, iberated iodine so quickly that the fluid assumed a blood-red tint in less than one hour rom the time of iodizing. In both cases care was taken to remove all traces of adhering acid, and to use ether free from the ozonized principle.

"Having prepared a sufficient quantity of collodion in both of the states above-named, I was lesirous of ascertaining what effect would be produced by iodizing with a stable salt such as hat of cadmium, and using the preparations vhilst in a colourless condition. The difference was remarkable. The first produced good negatives, but the second, viz. that which possessed the property of displacing iodine from odide of potassium, gave very feeble and foggy pictures. In preserving the plates by oxymel he same difference was seen; with the latter collodion the developing solution of pyrogallic acid discoloured almost instantly on touching he film. I next tried them for the dry collodion process, but with no better result: the film in which the pyroxyline was in the modified condition before named at once discoloured the gallo-nitrate, and a faint image only appeared. t was impossible, in fact, to use the collodion n its then state for any process, although it had been made from the purest materials. The emedy which was adopted was simple: a econd portion of the same collodion was iodized vith a mixture of iodide of potassium and odide of cadmium, and set aside for twenty-four hours. At the expiration of that time it had become brown, and gave good negatives both on oxymel and gelatine plates; the developing solution remaining clear to the last.

"The practical inference to be drawn from hese facts is, that if any sample of plain collodion, iodized with iodide of cadmium, should rom the above cause fail to give a clear picture, it must be set aside for a week or two until a lemon-yellow tint is produced, or a little odide of potassium or ammonium must be added, and some hours allowed for the full isplacement of iodine to take place."—*Jour. Photo. Soc., Lond.*

REMARKS ON THE WAX PAPER PROCESS.

By Mr. Law.

[Continued from p. 212.]

V.—EXPOSURE IN THE CAMERA.

I have always obtained my best negatives with paper freshly prepared, *i.e*, exposed within twenty-four hours after being made sensitive. Exposure to atmospheric influence rapidly deteriorates the sensitive paper. Where it is impossible to prepare the paper and expose within the time I have just indicated, immediately after blotting off on *thick* bibulous paper the remains of the washing bath, place each piece of sensitive paper between two fresh sheets of clean blotting paper (the thinnest kind answers best for this) and subject it to pressure in a common positive printing press.

VI. & VII.—THE DEVELOPMENT AND FIXATION.

For developing, prepare a saturated solution of gallic acid in distilled water, and add about a drachm of *freshly prepared aceto-nitrate with twice the quantity of glacial acetic, used for exciting solution*, to each six ounces of the gallic acid solution, *i.e.*, one ounce distilled water, thirty grains nitrate of silver, seventy minims glacial acetic acid. Take care to develop sufficiently, so as to get the black deposits on the high lights, or the durability of the finished negative is problematical, and it will be impossible to print from it by *development*, than which I apprehend no safer criterion of the quality of a negative can be afforded. On this subject I have found Mr. Sutton's remarks invaluable. Wash, and fix the negative in the usual way.

In conclusion, I should like just to mention an improvement I have made in the application of collodion to paper.

I take a clean plate of glass, and having cut a piece of thin paper one-eight of an inch smaller than the glass each way, I float it on distilled water until it lies perfectly flat, also taking care that only one side is wet. I then draw it gently along the surface of the glass, taking care not to leave any air-bubbles underneath, (with a little practice this is easily managed), then with a piece of bibulous paper absorb all the moisture. I then coat the plate with collodion in the usual way. The film adheres to the uncovered portions of the plate, and thus forms at once an adherent surface, and a perfect protection to the paper from any staining on the back, &c.

The remaining operations were conducted in the ordinary manner. When the picture is dry and varnished, it may be removed from the glass by passing a penknife round the edge of the plate. The paper will then leave the glass and give you a perfectly portable negative. By this simple contrivance I flatter myself that all difficulty in the way of working collodion upon paper is obviated.

A vote of thanks was given to Mr. Law for his paper and for the presentation of some admirable specimens obtained by his process.

The meeting then adjourned to September 29.

[Mr. Law's remarks upon the utility of pointing out the *causes of failure* which attend the various processes are very acceptable. We are acquainted with operators who "never find any difficulty," and who, consequently, never produce, except by chance, or for a short time, pictures of excellence. That the waxed paper process is capable of yielding "highly artistic" results we admit; and we have a particular desire to see it succeed, having been one of the first to introduce it into this country direct from M. Le Gray, who kindly showed us his manner of waxing the paper, at a time that its capabilities were unknown in England. We at

once began to use it even for portraiture; but we soon found that in this respect it was inferior to Mr. Tanner's wet process in point of sensibility and in the production of half-tint. We have been all along hoping that in these latter respects it would improve, but we cannot say that our anticipations have been "realized." Its great merit is its power of keeping clean for some hours; but if for the sake of sensitiveness it is to be used unwashed and moist, one had better use Tanner's process as being more simple, and, as we believe, more sensitive. Still we desire to see the waxed paper process practised and improved. We have seen English paper waxed and prepared exactly in the manner of the French paper, and with an equally good result; there is therefore nothing in the nature of the English paper to exclude it from trial. The difficulty is to get the right sort of paper, and until this difficulty is got rid of the paper processes will remain unduly depreciated. Good and pure bleached wax can now be obtained in London, and there seems to be no reason to take the trouble of melting the comb only to obtain a product which is tinted yellow, and only bleached by repeated exposure in the copying frame. It may not be universally known that the ordinary cakes of white wax were *never* pure. It has been the uniform practice of "the trade" to "temper" the pure material with cheaper fatty matters! Is it likely that this tempering, or *tampering*, would have been adopted if fatty matters had been dearer than pure wax? The method of removing the whole of the superfluous wax by bibulous paper is extravagant, and unless a good reason can be given for this method, the Marion's paper itself should be made to remove the excess; these sheets thus partly waxed can then be completely waxed as the first were, and so on. It will be observed that Mr. Law uses bromide of potassium. We wish this point could be settled. The bromide has been deposed by some operators of repute, and, if wrongfully through ignorance, reparation should be made. There are also discrepancies as to the effect of keeping photographic surfaces. In the Daguerreotype M. Claudet finds that the plates are most sensitive after some hours of keeping; other Daguerreotypists say they do not find this to be the case. Mr. Law says he has obtained his best results within twenty-four hours after the preparation of the paper. M. Martens, of Paris, tells us that he thinks almost all photographic surfaces are improved by keeping some hours. Now, what is the limit? This should be ascertained for each process. We should then have something more definite than an assertion that a good picture was obtained after several days' or weeks' keeping of the plate or paper. Mr. Law's statement is a practical one, "within twenty-four hours." Mr. Sutton gets credit for recommending a full development of the negative. This was always a great point in the practice of the Talbotype process; for copying by development was one of the first aims of the early operators in paper photography. A French company, who purchased Mr. Talbot's license for France, set out with the idea that no other plan of copying could be so useful, and they produced specimens equal to any done since, either by M. Blanquart Evrard, Sir William Newton, or Mr. Sutton. I[n] his patent, Mr. Talbot stated that copies migh[t] be made by development; and the writer o[f] this made many experiments at Mr. Talbot' request, with a view of superseding the ordinar[y] chloride paper. Some "tolerably good" result were obtained in 1850-51 by using chlorid of silver and sulphate of iron as a developer but the prints on albuminized paper were supe rior, and so all further attempts were suspended We shall be delighted to see a good develop ment process for positives; and whatever pho tographic merit M. Blanquart Evrard and Mr Sutton possess is due to their perseverin[g] exertions in this direction. Let them not, how ever, flatter themselves that they have solve[d] the problem. Their results are inferior to albu minized positives, and not equal in permanenc to engravings, or even to common writing ink We make these statements thus distinctl because an endeavour is being made to raise by constant clamour, an impression that *grea[t]* improvements and discoveries have been mad in this direction.—Ed. L. & M. P. J.]

THE COLLODIO-ALBUMEN PROCESS.

By J. Draffin, Esq.

[Concluded from p. 210.]

There is another thing I should here mention I ought to have done so in the washing pro cess. Great complaints have been made holes in the skies of collodio-albumen nega tives. I think I have discovered the cause Let any one examine a prepared plate after has been washed in common water, and he wi find it covered with minute gritty-lookin particles: these, if not removed, will caus holes. I always pour a little filtered rain distilled water over the plate after taking from bowl No. 3. Since I have adopted th plan I have got rid of holes in the skies. Whil the half-dozen albuminized plates are drying i the oven I proceed with another half-dozen, before, and by the time these are ready f coating with albumen those in the oven are dr I therefore take them out and place them in cool part of the kitchen, where the film becom rather softer and in better condition for th aceto-nitrate bath; for when the plates first con out of the oven the film is almost as hard as th glass itself, and can scarcely be scratched. Whe I have got the quantity of plates albuminized ar dried, I then change the water in the bowls f fresh, and sensitize the quantity of plates in th aceto-nitrate bath I may require for immedia use, washing each plate just the same as befor Well washing is very essential here; if n stains are sure to follow. If I prepare four or fi dozen plates at once I never sensitize more th a dozen at one time in very hot weather, as am quite satisfied the plates are not so good aft being kept four or five days. After all a washed I place them in the oven again dry, and afterwards place them in the plate b ready for the camera.

You will observe that in drying I always u heat: to this, and this alone, I attribute n freedom from blistered plates. I have work this process some time now, and have nev but once encountered blisters, and that once

ared the plates in a damp place and allowed n to dry spontaneously.

EXPOSURE IN THE CAMERA.

s to the exposure to be given in the camera, efer the plates to be, if anything, rather er than over exposed, because an under osed picture can generally be brought up he development, but it is the contrary an over exposed picture. With a six- focus lens and quarter-inch stop, I give ut two minutes; with a four-inch focus and uarter-inch stop, and bright sunshine, I ve from forty-five seconds to one minute: lepends on the subject, whether dark or t,—bright weather is of course the best for process in particular, but some of the nega- s before you were taken in very gloomy ther. The negative of the Independent ege Gates was taken whilst very gloomy ed; time given was, with four inch focus quarter-inch stop, three-and-a-half minutes. as just commencing to rain as I replaced cap.

THE DEVELOPER.

he developing solution is made as follows:—

yrogallic acid	$1\frac{1}{2}$ grains.
lacial acetic ditto	15 drops.
irits of wine	15 „
aturated solution of gallic acid	1 ounce.

a small quantity, say three or four ounces, thirty-grain solution of nitrate of silver, in illed water.

believe many a good picture is spoiled from t of care in the developing: this is half the le, and the slightest inattention here will t all the care that may have been taken in preparation of the plates.

lace the plate on a levelling stand, pour er over the surface of it to moisten the film, ove the water, and with a mixture of about drachms of the developer and nine or ten s of the silver solution, cover the plate. picture will soon begin to appear. Keep developer in motion by blowing slightly, you may have marbling, or clouding, in skies, which would spoil the negative. the solution should become dirty, don't r off, but take water and pour on the e: this washes all off without leaving any he sediment adhering to and staining the ative. Mix another portion of the solution, , after pouring off the water again, cover the ure, and the developing should be complete about fifteen minutes, perhaps sooner. A at deal depends on knowing exactly what to stop the developing, for if you over elop the negative is too dense to print well. ake a practice of looking for the detail in the dows; as soon as they appear, wash off and with hyposulphite of soda. It is better for cture to be under developed than over, be- se in this process the developing can be ceeded with at any time after they are fixed, viding the negative is not varnished. I e a plate here which I have exposed, and will elop to illustrate my plan of proceeding in stage.

make the albumen according to the following portions:—

Albumen	2 ounces.
Water	2 drachms.
Syrup	2 „
Iodide of potass..............	15 grains.
Bromide „	10 „
Glacial acetic acid	6 drops.

I may remark on this formula that more bromide is used than is usual. My reason is this—and though I am aware that there is much difference of opinion respecting the use of bromides—I believe them to enable us to obtain better delineations of foliage than we can obtain without them, and, therefore, I employ them in larger quantities than usual. The syrup used is such as is generally used by druggists, consisting simply of two parts sugar boiled with one part water. A piece of sugar added to the albumen would answer equally well. I use syrup because it is convenient to me, and is always transparent, and employ it to prevent the albumen film from cracking when subjected to heat.

Acetic acid is used partly to coagulate the albumen and render it limpid, which it does in a remarkable degree. I find it filter more easily and flow more readily over the plate, when acetic acid is used instead of ammonia, as is frequently recommended.

The acid bath I make as follows:—

Nitrate of silver...............	45 grains.
Glacial acetic acid............	1 drachm.
Distilled water	1 ounce.

I keep a small quantity of kaolin in the bottle, which prevents the bath from becoming discoloured.

ON THE FADING OF POSITIVES.*

By Thomas Sutton, B.A.

"By the fading of a positive print is meant the conversion of the dark material of the shadows into a pale yellow or yellowish brown substance.

"In order to understand why a print fades, we have therefore to enquire why the dark substance which originally formed the shadows becomes converted into a pale yellow substance; and it will be a question quite foreign to the enquiry, whether the yellow substance be permanent or not, inasmuch as a pale yellow substance cannot with propriety form the shadows of a picture.

"The yellow substance of a faded print is believed to be a sulphide of silver; and this yellow sulphide of silver is supposed to be permanent. At a recent meeting of the London Photographic Society Dr. Percy stated his belief that the sulphide of silver was a permanent compound of that metal; but in the discussion which followed that remark he is reported to have said—'I spoke of the yellow colour; it is quite permanent; for six or seven years I have never found it to change. A colour of that kind is very suitable for some subjects.' When, therefore, the permanence of the sulphide of silver is spoken of, the reader must bear in mind that it is the yellow sulphide, and not the dark substance that is meant.

"The process of fading may be exhibited artificially, by the following means:—

"Take a sun-print by any of the common processes, and fix it in fresh hypo, or ammonia,

* We shall, in our next, remark upon this paper, paragraph by paragraph. It is taken from No. 35 of the present volume of *Photographic Notes*.—Ed. L. & M. P. J.

or weak cyanide of potassium. Then wash out perfectly from the paper all traces of the fixing agent. The print will exhibit 'a hideous, staring brick-red tint.' A simply fixed sun-print is always of the above colour; it is not possible by any known means to produce a sun-print, which, when simply fixed, shall be of a dark colour. A fixed sun-print is always of a 'hideous brick-red tint,' and is consequently unpresentable until it has been toned by some process. Now make the following toning bath:—To one pint of water add two drops of hydro-sulphate of ammonia. The mixture must be made out of doors, as it has a most offensive smell. (Mr. Shadbolt has lately recommended a toning bath made by adding one part of hydro-sulphate of ammonia to four parts of water; but that is about a thousand times stronger than is necessary.) Immerse the print in it and watch the changes which take place. The brick-red tint soon begins to darken; in a few minutes it passes through various shades of brown to a black, or purple black, and becomes ultimately yellow—so that the bath, which, up to a certain point, tones and improves the print, if allowed to act too long, causes the blacks to become yellow.

"We have in the above experiment the whole process of toning and fading, occupying but a few minutes. The bath no doubt acts by imparting sulphur to the silver of the proof, and it appears by no means improbable, in fact almost certain, that the yellow colour is produced by an excess of sulphuration. If when the print is toned to a black tint, we remove it from the bath and wash it, (not once or twice, as Mr Shadbolt has recommended, for a minute or two,) but several times, in abundance of fresh water, so as to remove, if not all, at least the principal portion of the toning liquid from the pores of the paper, the process of toning is to all appearance arrested. But if the smallest portion of the toning agent is left in the paper, the process will go on slowly, but surely, and the print will ultimately become yellow; the process of fading being nothing more than a continuation of that of toning, the toning agent being diluted in strength, and the process consequently extending over a lengthened period of time.

"It appears, therefore, that in the process of toning and fading by sulphur, the action of the sulphur upon the silver of the proof goes on until the whole of the silver is sulphurated to the maximum, in which state it presents the well-known yellow faded appearance. We see, then, that sulphur toning is a process extremely likely to cause the ultimate destruction of a print, particularly when the quantity of silver in the print is small, as in the case of a sun-print.

"We now offer some speculations on the chemistry of the changes which occur in the sulphuration of a print to the yellow stage.

"In the first place, there appears to be good reason to believe that the presence of organic matter does not modify the effect to the extent that is generally supposed. Take, for instance, a collodion negative that has been fixed in hypo, or cyanide, and immerse it in the hydro-sulphate toning bath. It may be toned in the same way as a positive print, and in time the strongest blacks will become reduced to a yellow substance. Now, there is a strong reason believing that the pyroxyline film undergoes change during the process; while the black the negative, if rubbed by the finger in th dry state, appear to be just as much met silver as if the glass had been electro-pla with that metal. And again, if we print in usual way on a piece of unsized paper (blotti paper), the very same yellow toning may produced, and quite as easily as if the paper been sized with organic matter.

"If, then, we omit the consideration of any ef which organic matter may have on the nat of the image, we shall simplify the problem siderably. But at the same time we must be misunderstood. There *may* be a combinat of organic matter with the material of image, and this *may* affect, to some extent, mode of action of the sulphur, and the natur the ultimate product. We omit this conside tion at first, in order to ascertain how fa plausible hypothesis can be constructed w the problem is reduced to its simplest form.

"Let us then suppose the question redu to this:—Why does the black sulphide of sil become yellow by excess of sulphuration?

"Now, is it not probable that silver, dur the process of sulphuration, passes thro various stages of sulphuration, until it eventu reaches the form of yellow sulphide? May th not be a black sulphide, Ag, S, and a yel sulphide, Ag, S 2? Sulphur is known to comb with may of the metals in various proporti We have the ter-sulphide and the penta-sulph of antimony; the proto-sulphide, the ses sulphide, and the bi-sulphide of tin; the bi- phide, the ter-sulphide, and the penta-sulph of arsenic; several sulphides of barium and ir a sulphide, bi-sulphide, and penta-sulphide f calcium; and so on;—so that there is n a priori ' improbability that there should be m e than one sulphide of silver. If, then, we n show that the black and yellow sulphides f silver are *not* isomeric, but that the former is n unstable proto-sulphide, and the latter a st e per-sulphide, we shall have done much tow s clearing up the mystery of the fading of phurated prints.

"In a letter just received from Dr. Al d Swaine Taylor, he observes,—'I think lead d silver have higher degrees of sulphuration t n those commonly assigned. All the per-sulph s give an orange red precipitate with a sal f lead, and it is not improbable that this is a), S 2, or Pb, S 3, according to circumstances.'

"Or, may it be, that the yellow salt is a do e sulphur salt, formed by the union of the b k sulphide of silver, which is a sulphur base, h sulphuretted hydrogen, which is a sulphur l.

"But there is another phenomenon conn d with the fading of positives. They turn ye w in consequence of oxidation, as well as of l- phuration. How is this? The explanatio is easy if we adopt the notion of two dist ct sulphides of silver, a black and a yellow, w ch are not isomeric. An oxidizing agent w d, by removing one atom of silver from the pr o- sulphide Ag. S, convert it into oxide of si r, Ag. O, and the yellow sulphide Ag. S 2. he oxide of silver would then form a salt, ei er with the oxidizer employed, or with the id

c or latic), formed by the decomposition of ze or paste, and would either be removed nain in the paper as a white insoluble ınce, while the yellow sulphide would n.

nother view of the cause of fading by tion would be, that the sulphide of silver ıes converted into sulphate of silver and ulphur. Professor Schönbein has shown most of the metallic sulphides may be oxidized into sulphates. Sulphate of is a white salt, soluble in boiling water, ı ammonia at ordinary temperatures. The ate of silver might therefore be easily ved from a sulphurated collodion negative, by digesting the remainder in nitric acid, reating it with a chloride, the presence of in the yellow portions could be detected. chemist, who has the means of performing iece of analysis, may be rewarded by being o throw much light on the mystery of the g of positive prints.

rints are generally found to fade more ly in the dark than the light, just as ances are oxidized more readily in the A fire, for instance, is sometimes put out inshine, and always burns least at night. ıe same time damp and darkness generally gether, and damp would favour oxidation, ılso sulphuration, should any sulphur re- in the paper.

aper frequently contains sulphur, either in orm of sulphate of lime, or of free sulphuric or of sulphide of sodium introduced as blue ring matter. The sizing is sometimes ed with incipient putrefaction, and nothing then stop the further progress of decay; ever dry the paper may be kept, the size hen continue to putrify, until of course both paper and the print are destroyed.

Should a *minute* portion of sulphur remain in aper, in consequence of insufficient washing, evident that a print containing a *large* tity of silver would be entirely destroyed ; and therefore a developed print would a decided advantage over a sun-print in power of resisting the attacks of the foe. oes not appear that so much is to be feared the sulphur existing in the atmosphere, rom that which may be left in the print. Hardwich has shown that a Daguerreotype may be greatly tarnished by an amount ılphuretted hydrogen which did no injury ositive prints exposed along with it. The ssity of copious and thorough washing after lphur toning bath is evident; and whatever be the nature of the chemical change which s place, *that* is the practical conclusion with ch we are most concerned. If we tone with hur we must remove all traces of the toning , or the print will infallibly become yellow, he process of toning is always continued to yellow stage when sulphur is present.

And now comes the important question, is *ossible* to remove all traces of the sulphur ng liquid from the paper by mere washing? if not, what chance have any prints pro- ed by the ordinary methods of lasting more a year or two? These are questions ch every conscientious photographer must imes ask himself, and endeavour seriously to solve. If, year after year, the great bulk of the prints which are produced by the common methods, and toned in a hypo bath containing chloride of gold, are to go on fading, how long can such a process last? Is it not utter folly to rest content with it, and permit all enquiry with respect to it to cease? Would it not be much more honourable, and in the long run much better policy, to admit what cannot possibly be denied, and endeavour at once to remedy the evil? There is a tendency just now among professional photographers to allow the question of the fading of positives to drop, while the old process is permitted to continue in full operation. But this is miserably short-sighted policy, as the event will certainly prove. If photography is not to decline rapidly in public estimation, the printing process must be placed on a much sounder basis than it is at present. There must be some guarantee for the public that the paper does not contain within its pores a substance which will ultimately destroy the photograph; and the longer the present bad process continues in operation the more difficulty will there be in inducing purchasers of photographs to accept and believe in such a guarantee, when it shall become possible to offer it.

"It may be useful to consider how far washing the print in hot water may be a good plan. It has been recommended by Mr. Hardwich, but in practice we do not find it to answer. Should any of the toning liquid remain in the paper when the print is placed in hot water, the heat greatly accelerates its action, and the beauty of the picture is destroyed *at once*. On the other hand, should the toning liquid have been removed by washing in cold water, there will be no use in further treatment. Until it is proved that the destructive agent is more soluble in hot than in cold water, and that it cannot be entirely removed by cold water, the utility of hot water treatment must remain an open question. It appears certain that that portion of the shadows which is formed by silver alone is, to a certain extent, soluble in hot water, which therefore injures the vigour of the print."

HALLOTYPE PATENT.

Dated January 20th, 1857.

To all whom it may Concern.

Be it known that I, John Bishop Hall, of city, county, and state of New York, have invented certain new and useful improvements in the treatment of pictures, and I do hereby declare that the following is a full, clear, and exact description of the same, that is to say:—

My invention is certain improvements in the production of a high degree of artistic and stereoscopic effect in pictorial representations of objects, and is applicable to all kinds of prints, such as photographs, engravings, lithographs, and similar productions. The principle consists in combining two or more of the photographs, engravings, &c., as the case may be, to form one picture, and which are to be fac-similes or duplicate impressions upon a material semi-transparent, or capable of being rendered more or less transparent according to the effect to be produced.

Those pictures are to be so placed above each

other that the general lines will coincide, when one, both, or all pictures are cemented or secured to a plate or plates of glass. A variety of effects may then be formed, either by colouring, tinting and shading, by cutting out parts of the back picture, or by all together in differing combinations, the effects being capable of being heightened in many ways. In addition to this, a back ground, made of white, light, or reflecting material, is placed behind the pictures; white paper, mirrors, or a plate of enamelled china, produce good effects. These back-grounds may be substituted by painting over the back of the last picture with a white or light colour; by silvering it, or by applying quicksilver thereon.

These are variations, depending on the convenience and taste of the operator.

Pictures of all kinds, and especially photographs, are perfectly preserved against decay or deterioration from the action of the atmosphere, and particularly from that of dampness.

I will first illustrate my invention by a description of its employment in the treatment of photographs, to which it is especially applicable. If the picture is a portrait, two or more copies are to be taken in the usual way, upon photographic paper, and I will describe it as applied to two. These pictures are rendered more or less transparent by the application of oil or its equivalent, and each is to be cemented to a separate plate of glass, by means of copal or other suitable transparent varnish, which has been previously applied at a time sufficiently in advance for it to become partially dry, or as it is technically termed "tacky." In applying the picture to the plate of glass, care must be taken to work out all the air bubbles from beneath, in order that it may be in close contact with the glass. Each picture is then allowed to become dry, or nearly so, when it will be well to scrape off the back carefully to remove any excess or lumps, and to leave a smooth surface. After this, one or more coats of copal or other suitable varnish is to be given, and when this is dry, the two plates of glass are to be joined together so that the lines of the pictures will coincide, in which position they must be cemented or framed together. When two back pictures are prepared for the combination, they may be cemented on opposite sides of the same glass, instead of upon separate plates as above set forth, or the imprint or photograph may be taken in duplicate upon opposite sides of the same paper or other substance proper for the purpose.

These variations, although embracing the same principle, do not for all purposes produce equally good effects with the first described plan. The above is a description of the improvement in its simplest form.

Different effects may be produced when the front picture only is executed on or attached to the plate of glass, and the second one placed behind it, so as to correspond with the other; or when the front and back pictures are secured between two plates of glass with gum gomar, balsam of fir, or similar substances, remaining in a liquid state. Colours may be applied to the back picture only, or partially to both, or so that one colour in the front picture may have a ground of another colour in the back picture. Very fine effects are produced by cutting certain parts of the back picture, thus allo[wing] more light to pass to the front one. Additi[onal] back-grounds of colours may also be emplo[yed], all which can be determined by the taste [and] skill of the operator.

It will be seen that the picture is sec[ured] from atmospheric agents or effects, the first being sealed between the glasses, while back one is protected by the varnish, or one may also be sealed by cementing an a[ddi]tional plate of glass or other proper mat[erial] over it, and by a frame securing a hern[etic] joint around it. In the above, paper is spec[ified] as the material upon which the imprint sh[oul]d be taken, but there are many other substa[nces] which may be employed for that purpose, [par]ticularly in the case of photographic pict[ures]. The process may be varied by producing picture directly upon the glass, either by s[ome] system of transfer, or printing, or by the ph[oto]graphic art, and like effects still obtained.

I claim producing in pictures to be seen [by] direct light, a high artistic and stereoscopic e[ffect] by combining with a white light, or reflec[ting] back-ground, or its equivalent, two or [more] identical pictures of the same subject, rend[ered] more or less transparent, and executed o[r] attached to plates of glass in the manner [sub]stantially as herein set forth.

(Signed) JOHN BISHOP HAL[L]

THE DAGUERREOTYPE FOR SCIENTI[FIC] RECORDS.

THE report of the Kew Observatory, prese[nte]d at the meeting of the British Association, [ob]serves, with respect to some experiments [tha]t have been made with a view to photograph [th]e spots of the sun's disc, that the imperfect[ion]s of the collodion film are so apparent in [th]e negative pictures made, that it is dee[me]d advisable to have recourse to the posi[tiv]e process, and it is even contemplated that [th]e Daguerreotype may ultimately alone hav[e t]o be employed.

This is only returning to the former prac[tic]e of the Kew Observatory, as carried out by [M]r. Ronalds. Some years since we assisted, [co]n *amore*, at Kew in the photographic experim[en]ts relating to meteorological registration, [an]d although we succeeded in making an e[xa]ct fac-simile *in the camera* of a square foot of p[ap]er divided exactly into square inches by lines, [M]r. Ronalds could not be convinced that suffic[ie]nt accuracy was attainable on paper. Reco[ur]se was therefore had to Mr. Beard for permi[ssi]on to use the Daguerreotype, and Mr. Nicklin [w]as engaged to carry out the process. Witho[ut] at all admitting that "it is little better than chi[ldi]sh folly" to employ collodion, we may say th[at] it does appear to us that as far as experience [h]as been obtained the Daguerreotype does [yie]ld greater delicacy and accuracy of result for [su]ch scientific purposes. We are of opinion tha[t t]he Daguerreotypes of the moon shown in [t]he American department of the Exhibition o[f 18]51 have not been equalled by anything done [up]on collodion, Mr. Crookes' praiseworthy result[s n]ot excepted. We, however, still expect to [s]ee collodion made available for scientific regi[str]ation purposes.

CORRESPONDENCE.

the Editor of the Liverpool and Manchester Photographic Journal.

,—Having read with much interest the remarks on the Photographic department of the Art ures Exhibition, and also those of θ in the on Journal, which are singularly corroborative opinions expressed in the former, I have, of , noticed the very natural expressions of sur- at the absence of Manchester productions, and k it only justice to the members of this society should state what I know of the matter. A er of Mr. Delamotte's circulars, stating there be room for about a thousand pictures, and sting a complete series of portraits of eminent were sent to me, and by me to most of the bers of our society; advertisements were also ed that I would take charge of Manchester graphs. In consequence, I received several f photographs from members—one lot framed. culiarly inconvenient plan was here adopted: s instructed by Mr. Delamotte to send the res to him, for examination, in London. Of e this stopped Manchester contributions, for it lear that the best way would have been to have ictures inspected here. However, the pictures sent to London (after taking the framed ones f their frames); and what was the result? I re to say that many of the pictures sent by me cannot refer to those sent direct to London) of more than average merit. I think judges be ready to allow that much worse specimens been hung, and yet only two paper pictures through me have appeared in the exhibition. pictures that I sent were returned to me,* everal of the parcels appeared not to have even opened. This treatment of exhibitors is unfor- e; for not only are they disappointed by the ion of their own pictures, but they are dis- ged with respect to future exhibitions, and the advancement of the art is permanently ged. I know not to whom to impute blame in matter, but it assuredly lies at some one's door. e not yet aware what Mr. Delamotte's position he committee was; but I have no doubt that he aboured under some restrictions which have d to the present state of things. The situation photographs is very bad, and as the band is to, and is a great attraction, you cannot with ort inspect the pictures which are thus treated comparative neglect. I hope that this chapter secret history of the exhibition may soon be ded. The complaints I hear are neither few nor etween, and their utterance is not only deep ud.—I am, yours truly,

nchester, 10th Oct., 1857. HON. SEC. M.P.S.

* t until I had been threatened with legal proceedings, of Mr. Delamotte was informed.

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the Editor of the Liverpool and Manchester Photographic Journal.

,—I shall feel obliged if you will, in the next ber of the *Liverpool and Manchester Photo- ic Journal*, answer me the following queries:—

In taking negatives, developing with the iron on, and afterwards intensifying by means of sive sublimate and dilute ammonia, I find on late drying *innumerable* small holes which print gh. The bath was *quite* clean, and the collo- gives a slight creamy film, but cannot be over ed, as positives taken with the same collodion bath are everything I can desire.

In using a bath for positives, which has been e since February last, I found a sort of repul- at the upper part of the plate (the lowest in the ra), between the film and the developer, and a wave was the consequence. Can you tell me how to obviate this tendency in the bath? It is not owing to insufficient acetic acid in the developer, for I pre- pare that as follows:—

Proto. Iron	20 grains.
Acetic acid, gl.	30 drachms.
Alcohol	10 „
Water	1 ounce.

This gives a beautiful dead white, and has the advantage of remaining good for weeks. You may say "try pyrogallic for negatives;" my answer is—that to develop a negative properly, I have to expose for fully three-quarters of a minute, whilst by the other process ten or twelve seconds is amply suffi- cient, even when the light is not strong. Hoping you will kindly favour me with the desired infor- mation, and apologizing for the trouble incident to the enquiry.—I am, Sir, your most obedient servant,

W. GUNTER.

[The defect No. 1 is not familiar to us. Does the collodion require filtering? Small solid particles might interfere with the production of a negative, though not injurious to a positive, which is obtained by a less exposure to light; we have seen albumen plates full of holes in the sky, and yet the half-tints were free from them. Can you use the same collo- dion with a less acid bath? an experiment on a small scale would suffice. No. 2 is to us equally obscure. Dip the plate again into a silver bath after exposure, or use more alcohol in the developer. Making a new bath is often the best way to get out of the difficulties induced by a very old one. Can you give the exact details of the manufacture of the collodion you use? Although we were the first to produce and publish a process for direct positives on glass, we have never been great admirers of the art. We always regret that a successful positive is not a good negative. The advantage of multiplication on paper is great; still we have seen positives on glass, especially some American ones, which tempt us to think it desirable to have a good positive as well as a good negative of the same person. We must not omit to mention that the American process, when tried in London, failed to give results of equal beauty and brilliancy. Perhaps some of our readers will be good enough to remark upon this subject.—Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Having constantly worked the positive col- lodion process since 1852, and during that time tried most of the methods of colouring in use, I have found none succeed so well as the process I give below, when the usual powder colours are intended to be used. The two processes given in the last number are defective in many respects: First, the isinglass requires to be warmed each time it is used, and very often cracks under the varnish in damp weather, spoiling the picture; the same with gela- tine. Second, the turpentine process is very diffi- cult to manage properly, the colour sticks in patches, and when poured on it requires a very strong heat to dry it, often causing the loss of the picture by the glass breaking, particularly in frosty weather. The process given below is free from those objections.

Make a saturated solution of shellac in alcohol "without heat," mix one drachm with twenty-three of alcohol, well shake it and filter; *very* slightly warm the picture, pour this solution on in the same way as collodion; let it dry; then colour as usual, and varnish with a solution of benzole and gum dammar. A little retouching will complete all. This method will succeed best with a good black and white posi- tive, not so well with the yellow-browns now so plentifully seen in every street. In your next I will give the process of putting in backgrounds, and the

proper way of working up a picture in colours.—Yours truly, THOS. GULLIVER.

Fisher-street, Swansea.

[We are much obliged to our correspondent for sending us his experience. "Lillywhite," whose letter will be found near this, must be a more patient experimenter, since he has succeeded with the turpentine varnish. We, however, advise him to try your method.—Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Intending to take a number of views of this locality, I thought it would be a saving of time if I took a walk round and decided upon the exact points of view before taking the apparatus to them. I did so, but at the very onset I found myself at fault, I could find many good points but was at a loss to pitch upon a right one, not being able to tell how much space the camera would take in; therefore, not being able to tell whether the view when taken would form a picture or not—and carrying your camera and tripod about in this country is no joke,—I set my wits to work, and soon hit upon a very simple invention which fully answers my purpose. I went home and set my camera at a view, I then got a piece of card-board and made it funnel shape, about three inches long, one and a-half inches at the widest end, and half-an-inch at the other, securing it by pasting several layers of paper round it; I dried it at the fire, and cut away from the smallest end till by placing it *close to my eye* I could see exactly the same objects that were shewn upon the focussing glass. I find it to answer my purpose exactly, and it saves much trouble.

I am not aware if such a thing be known to photographers, if not, I am sure they will find it very useful.—I am, yours respectfully, J. F.

P.S.—I find it immaterial whether the view be near or distant.

Bowness, Windermere.

[Such a contrivance has been used and ought to be on sale. Of course the cone or pyramid should be specially cut to suit the focal length and field of view of each lens.—Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Dear Sir,—I beg to refer you for a reply to your remarks made on me in No. 19 of the *Journal*, to No. 36 of Mr. Sutton's *Notes*, and I may also say that I tried the recipe in your last publication for colouring collodion positives, at the time it appeared in the London Society's *Journal*, and found it very satisfactory, the ordinary powder colours adhering nicely to the plate; but the recipe No. 2 I cannot say anything in favour of, not having given it a trial.

It is much to be desired that photographers would lay before the public the results of their experiments.

Wishing the *Journal* to be prosperous, I beg to remain, LILLYWHITE.

Oct. 3rd, 1857.

[We have already in our "Answers to Correspondents" acknowledged the perusal of the letter of our *no longer* anonymous correspondent. We shall yet notice his letter of complaint, and the remarks it has given rise to, but we desire first to reciprocate the feeling which has induced him to oblige us with the present *practical* communication.—Ed. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

Observer.—We have, at the last moment, seen the letter of our once *anonymous correspondent*, "Lillywhite," but at present we have neither time, space, or inclination to remark upon it.

J. R.—Canson's paper is said to be inferior, present time, to other French papers. Perha[ps] is only a temporary circumstance. We shoul[d con]tinue to try Canson's paper against others.

X.—A few drops of ammonia added to all will cause it to keep good for a long time; mixture is used by one of our best operat[ors] albumen. Tone the albumen pictures, on with chloride of gold in the hypo; unless you you will not get the colour you desire.

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THE LIVERPOOL & MANCHESTER

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 21.—NOVEMBER 1, 1857.

selecting a dry collodion process for general e, the facility with which any given formulæ n be manipulated, will naturally influence the perimenter in his choice. The process comled by Mr. Long, an outline of which we have ready given, fulfils nearly all the requirements at a hurried tourist needs. It has therefore, we anticipated, begun to make its way, ing frequently well spoken of by those best pable of judging of its merits. Those who ve not yet decided upon the process they ll adopt, will do well to start with Mr. Long's structions, modified by the remarks which ll be found in the report of Mr. Hooper's per, which was read at the last meeting of e Chorlton Photographic Society. We still ve to be convinced that any dry process can present be named, which shall give results ual to the best wet collodion method; and til this point has been clearly settled, advise those who can spare the time, and ho are not to be deterred by a little tra labour, to use wet collodion, developed near to the scene of action as possible. ie satisfaction of knowing, before you leave e spot, that you have a good picture, itweighs many other considerations. You ve to consider how *your* picture will look hen placed upon the walls of the Exhibition om, side by side with the works of competitors m every part of the globe: the operator who es not act with this thought in view, will rely, if ever, emerge from the "slough" of ediocrity.

In reflecting upon the subject of processes, e are again impelled to assert our conviction, at a committee, or sub-committees, should be rmed out of the *general body* of photographers cluded in any given Society; and we are glad find that a contemporary, with whom we are metimes at variance, is inclined to support us this matter. The Editor of the *London ciety's Journal* sees so many difficulties in the ay, that it is evident London will not readily ke the lead in this matter. One answer to arly all objections is, that *they manage these ings in France.* The French photographic *commissions* are adopted from the practice of the Paris Academy of Sciences. We ask only for possibilities—we do not expect Mr. Maxwell Lyte and others to come to England expressly, and at the bidding of the society. Let each country decide upon the processes which are developed within its boundaries. In England we have, placing them alphabetically, Mr. Ackland, Mr. Barnes, Mr. Crookes, Mr. Lewellyn, Mr. Long, Dr. Hill Norris, Mr. Shadbolt, &c., &c. Surely there can be no harm in asking these gentlemen to operate, or depute some one to operate in the presence of *disinterested* judges; all will not refuse, and those who accede to the request will gain a fair advantage over the others, as a result of their public spiritedness. But we might say more than this—any process that is so delicate that it cannot be worked satisfactorily by deputy is not worthy of consideration. The *will* only is wanting; that found, we should soon have a fair tribunal, and *on the whole* give satisfaction to those who are worth satisfying: we shall yet see such a tribunal established.

Having been invited by the Committee of the Literary and Philosophical Society of Sheffield to condense for them the subject matter and illustrations of the lectures on photography, which we have given at various times at the Royal Institution, Albemarle-street, and at the London Institution, we have just visited "black Sheffield," the rival of Manchester and Birmingham in the production of anti-photogenic clouds and vapours. Being furnished with the *oxy-phosphorous* light we set these local difficulties at defiance, and had the satisfaction of arresting the attention of one of the most attentive audiences we have ever had the pleasure of meeting with. M. Delarue, of Chandos-street, Covent Garden, contributed to our illustrations some of his latest and finest French importations. The *Pavillon Sully*, an immense picture, by M. Baldus, was amongst them; but the greatest interest centred in the photogalvanographs and photo-lithographs of Herr Pretsch and M. Poitevin. Having the photograph, the gelatine image on the glass plate,

and its electrotype counterpart with a printed impression therefrom, the nature of the process was readily apprehended. Mr. Chadburn, of Sheffield, furnished us with a large positive collodion portrait, obtained by one of his large lenses. It is more satisfactory than any large one we have hitherto seen, still there is a coarseness about these very large pictures which is not agreeable. We prefer a moderate sized picture magnified to a slight extent. Mr. Chadburn has contrived an expanding diaphragm which may be found very convenient under many circumstances. He has also adapted a shield to the upper part of the ordinary large semi-lens stereoscope, which excludes the extraneous light in a very satisfactory manner. Here, too, we had our attention directed by Mr. Hornby to a specimen of cyanide of potassium which is prepared here largely for the electro-platers. It is said to be nearly pure, though produced by fusion. Its chief merit is that it does not alter the colour of the collodion positives fixed with it. It is much more powerful than the ordinary kind, and is much more translucent than what is usually sold. We did not recognize it as cyanide on first seeing it. At Mr. Chadburn's we saw optical glass grinding on a large scale; the shaping and polishing tools being worked by steam power. Here were lenses, semi-lenses, spectacle glasses, convex and concave, &c., &c., all being fashioned by instruments which neither tire nor grow careless. We were amused to find that the question of men *versus* machines, here received an additional illustration. Our readers may remember the differences of opinion we recorded respecting hand-made and machine-made paper. Having heard, from those who have not steam at their command, that there is nothing like the hand instruments for working and polishing lenses, we, with the greatest circumspection, asked if a machine could polish as well as the hand? Mr. Chadburn at once frankly mentioned the old-fashioned opinion, but did not hesitate to assert his belief that machine-work was quite equal to, if not better, than most of the hand-labour generally used. The discs of glass are worked with emery in cast-iron forms, and then polished by curved surfaces covered with cloth, charged with water and an earthy oxide of iron, found in beds in the neighbourhood of Sheffield. This natural rouge when ground with water, sifted, and allowed to deposit its heavier parts, contains nothing that can scratch glass. The machinery, at Mr. Chadburn's, is capable of "turning out" a hundred gross of glasses a week! The work is chiefly attended to by women. Much of th glass ground here is sent to America. W must not omit to mention a remarkable applic tion of photography we met with here. It wa the picture of an exploded steam-boiler, immense length and weight. This boiler ha *passed right across* one of the busy streets Sheffield, without striking any one; it then fle through some gates, and finally ended its care in the mud of the canal, where it lay till it wa photographed for legal evidence as to its cond tion. The story seemed so incredible that, bu for the photograph of the scene, one would hav doubted the possibility of such a mass taking strange a "flying leap," and yet remainin comparatively unharmed.

We see that the Photographic Society Scotland have determined upon holding a seco annual Exhibition, which is appointed to l opened on the 12th proximo. Those of o readers who may be inclined to forward spec mens for exhibition are reminded that the peri arranged for their reception is between the 25 and 30th instant, at the Rooms, 2, South S David Street, (corner of Prince's Street) Edi burgh, after which date none will be accepted

We are glad to hear that the works at t new Rooms recently taken by the Photograph Society of London, are so far progressed as enable the members to hold their next ordina meeting therein. The Secretary has express a doubt as to the completeness of the arrang ments by that date, but it is a step so f advanced in the right direction, that we thi the members will willingly bear with any litt inconvenience that may arise. We cann omit to mention that it has been arranged, the termination of the ordinary business of t evening, to hold a Special General Meeting the Society, for the purpose of taking in consideration a proposition for granting the su of £50 from the funds of the Society, for t benefit of the widow and family of the late M F. Scott Archer; which sum would have be awarded by the Council some time back, h they possessed the power to appropriate funds for such a purpose without the cons of a general meeting. We have no doubt th the opinion of the members will be unanimo and that the amount will be granted withou dissentient voice.

Manchester Photographic Society.—T annual meeting of this Society is appointed be held at 36, George-street, on the evening Wednesday, the 4th instant, when the atten ance of the members is particularly invited, assist in devising the best means for promoti its future interests.

VERPOOL PHOTOGRAPHIC SOCIETY.

E second meeting of the session was held Tuesday evening, the 21st ult., at the Royal stitution, Colquitt Street, Liverpool. Mr. rey, Vice-President, in the chair.

Among some beautiful specimens of the art, culated among the members for their inection, were several excellent miniature porits, by Mr. Keith, the Honorary Secretary. e back-ground was a delicate light colour of eat softness, and the portraits, which were ished in the style of enamel painting, stood t with great effect. Mr. Keith said he had ought them for the purpose of showing the vantages possessed by his new operating om in Castle Street, over the old one, the mer being constructed of tinted glass. The rtraits were much admired.

The CHAIRMAN having referred to the exisite photographs by Le Gray, exhibited at e previous meeting, for the purpose of citing a discussion on the probable means opted by that artist in taking such instanneous views, as enabled him to depict the fect of the curl of the wave, upon the a-shore,—

Mr. KEITH suggested that instead of the usual p to cover the lens, a perforated sliding disc as used, by means of which the lens could be covered and covered in the fraction of a cond.

Mr. COREY was inclined to think, as far as e mechanical contrivance was concerned, that at would answer the purpose; but they ould agree with him that no negative hitherto oduced by the agency of pyrogallic acid could e obtained with so short an exposure as that volved by the passage of the disc in the front the lens. It was clear, therefore, that some ther agent as a developer must have been nployed, exceedingly expeditious in its action. e was confirmed in his belief because the devepment was just as sharp in the fore-ground as the distance; but this could not be obtained y pyrogallic acid. He was convinced, therere, that these pictures were taken in the rst instance as positives, by the influence of on, and then converted into negatives.* They new that by a very moderate light pictures ight be obtained by iron, almost with instananeous exposure. Mr. Knott, one of our most xperienced operators, had said that he could ever produce a negative with the fore-ground nd distant perspective clearly rendered with nything else than iron.

The Rev. Mr. BANNER said he had taken iews almost instantaneously with pyrogallic cid. He thought he would have been entirely uccessful, but he could not get his camera ufficiently quickly covered.

The CHAIRMAN read a letter from Mr. Archiald Robinson, Honorary Secretary of the Bombay Society, enclosing the names of four nembers who are to represent that Society as onorary members of the Liverpool Photographic Society. They were ordered to be entered on he list.

Mr. J. B. FORREST announced that a member of the Society would bring forward, at a future meeting, a paper on "The Bath," and that another member would read a paper on "Winter Photography." The same gentleman having mentioned incidentally that the collodion film adhered so tenaciously to ground glass that it was almost impossible to scratch it off.

Mr. KEITH stated that Mr. Frith formerly made some experiments on polished ivory, finding the action very slow, he scraped the ivory with a piece of glass, and he then obtained a very rapid impression.

The Rev. Mr. BANNER exhibited and explained his portable stereoscopic camera, which, with the chemicals in a box, weighed about six pounds. He had two light tripods, on one of which he rigged up a small dark room, placing a sort of bag over the upper portion, the floor of this unique "dark room" being formed by a board which had also the effect of imparting additional rigidity to the tripod. On this board his materials, including bath, developing dish, bottles, &c., were placed, and he had free and ample access to them by means of a wide sleeve on each side of the bag. At the top of the bag was an aperture, ingeniously shaded, through which he could see into the room to guide the operations, and ascertain when the pictures were fully developed. The whole "room" was not more than a few inches square, and yet he found it as comfortable to work in as if he waa in his own house. He always washed the pyrogallic off inside the "room." Some photographers said it did not matter, but he thought they were in error, as the acid turned black immediately it was exposed to light. The camera might be either placed at the top of the dark room or upon a separate tripod. He preferred the latter plan. Instead of screwing the camera on to the tripod, he secured it by a stout elastic band.

The CHAIRMAN called attention to a series of prints published by the Architectural Photographic Society. They comprised prints from negatives by the most eminent English and French photographers, including Robinson and Beale, Bisson Freres, Fenton, Bedford, &c. Subscribers of £1 1s. and upwards would be entitled to select about eight for every guinea, and he stated that subscriptions would be received by Mr. Ellison, of 36, Bold-street, the local agent. He proceeded to expatiate on the striking and singular beauty of the pictures, which certainly were fully entitled to the admiration which they elicited.

Mr. J. A. FORREST made the following interesting and important observations on—"*Experiments in Burning Photographs into the Glass.*"

In the course of the summer, on the publication of M. Sella's process, I was induced to try some experiments with a view to arrive at some process that would enable me to fix the photograph by burning in the impression in the furnace with a coating of glass over it. From the specimens I exhibit to night it will be for you to say how far they are encouraging. I regret exceedingly that my brother photos cannot try the experiments themselves, as very few have the opportunity of a furnace in which to try them. I may, in passing, however, give them some encouragement, for out of these trials I find if

* By the agency of bichloride of mercury, and afterwards ammonia.

you grind a piece of opal glass very finely, afterwards collodionize, sensitize in the usual manner, and lay a negative upon it by superposition you will receive a very beautiful impression by transmitted light, and after being fixed, washed, and dried in the usual manner, you will discover that the film adheres most rigidly to he glass, and scarcely any amount of rubbing will take it off. This is a plan that any one may follow out on a winter's evening by gas light, and no doubt would look remarkably well in a hall lamp, or you might have your staircase window filled with landscapes taken by yourselves or friends. Any silver stains by this process can only be removed by regrinding the surface with fine emery. I will now proceed with the more immediate object of the evening. In or about the year 1280 it was discovered that the salts of silver, when laid upon glass and exposed to a temperature of about 750 degrees of heat, gave a beautifully transparent yellow, and during the time known as the Decorated and Perpendicular Periods, from the quaint and formal description of the figures, it was this metal produced the brilliant glories around the heads of the saints in church windows, and is handed down to us in its pristine beauty, and with the prospect of remaining the same for ages to come; but in that day the discoverer did not think of the part the salts of silver should play in the nineteenth century, nor of the difficulty we should experience in making our work as permanent as his. My object this evening is to elaborate a few experiments on glass positives that have been permanently burned into the body of the glass, and to lay open a new field to the intelligent photographer. I do not consider the matter by any means perfect, but I think the specimens I now exhibit are highly encouraging, and leave little ground to doubt that it will soon lead to this very desirable end. It has been patent to all the members of this society, that in conjunction with Mr. Berry, we laid before you in the early part of this year a specimen, which if not entirely fixed into the glass, was nearly so. Since that time I have been occupying my spare moments in following it up. The great difficulty we always met with was the destruction of the image in the furnace, and the residue became a pale yellow, with complete obliteration of the fine lines. I found, however, that the yellow was only developed by a continued heat, and in this position I left it, and resolved to try the chromic salts with a flux or glass film over them. The process I found best in this direction to produce the photograph was the following:—Float a solution of starch over a piece of glass; then pour upon it, when partially dry (in the dark) a solution of chromate of iron: allow it to dry, and print in the usual way by a negative laid on the coating. When taken from the pressure frame wash and strengthen with sulphate of iron. When this is done on opal glass, say a stereoscopic print, it has a very beautiful effect, and the delineation is quite equal to the salts of silver; but the great barrier to its success is the contractile natur of the starch, which breaks up whenever exposed to heat. Having tried every vehicle I could think of, I then threw overboard the chemistry of the subject altogether, as I thought, and resolved to treat it in a mechanical point view. Having succeeded in this direction to certain extent, I now lay before you my pl and results thereof. Take an ordinary gl positive, varnished or plain, (I prefer the latt and make the following mixture in oil of tar

Flint glass (ground very fine)	16	parts.
Pearl ash	6	"
Borax	1	"
Red lead (or minium)	3	"
Chloride of sodium	1	"

This must be thoroughly ground and laid eve over the plate. When dry, lay it upon a pi of iron, lute over with whiting, and expose in a furnace to, say about 750 degrees he until you perceive it becoming bright on t surface. For the first minute it will gradua become black, and afterwards the black d colouration like carbon passes away, and t photograph comes out with a covering of gl before the oxide of silver has passed into natural yellow colour, and without the slight change upon the half-tones. All this is t work of two or three minutes, and in this st may remain or become the basis of furtl operations in burning in the natural colou Photographs on porcelain look beautiful wh treated in this way; in fact it would be diffic to point out all the uses to which it may applied. Thus far I had proceeded, but desiro to pursue the subject as much towards maturi as possible, I have enlarged the experimen An intelligent friend had suggested that t whole of the chemical and organic agents we not yet exhausted, that having with infin pains tried the effect of starch, gums, album honey, gelatine, and other analogous materia caseine had not been employed. I theref determined upon trying organic matter in tl form. Once more resuming the chemical expe ments, and acting upon the previous suggesti I boiled milk until thick, applied it to the surf of the glass like collodion, and allowed it to d A solution of sulphate of copper and bichrom of potash was then poured over it, and allow to dry in the dark; exposed under a negati until a good distinct impression was obtaine then washed well until all the yellow w erased from the lights. I then used a soluti of ferro-cyanide of potassium until a chan took place from brown to green, washed ca fully, and poured over a solution of sulphate iron to intensify. This process is one of gr promise, and does not seem to break up in t furnace like the starch. I hope by the ne meeting to exhibit some specimens.

Mr. Forrest produced several specimens, sho ing the results of his experiments, some to be u as transparencies for hall lamps, staircase w dows, &c., and others to be seen by a reflec light, with a darkground under them. Some of t transparencies, taken on opal glass, were ve beautiful. They were taken, he said, with w collodion, and he was satisfied that he co print 200 or 300 a day. Referring, in connect with the same subject, to the oxidization of t silver in the furnace, he stated that th were many combinations of silver, of which the present day, we were completely ignora and he instanced a case in which one of men, in prepa ing a furnace for the product

yellow glass, neglected to withdraw the . The glass on being taken out instead of ow was a brilliant purple. It was spoiled the purpose it was wanted, but the mistake produced a great novelty. He had since mpted to obtain the same results, but had been successful.

vote of thanks to the treasurer for his paper observations terminated the proceedings.

CHORLTON PHOTOGRAPHIC SOCIETY.

; fifth monthly meeting was held in the rlton Town Hall, on Thursday, the 8th of ober, the Vice-President in the chair. After usual preliminary proceedings, the following er was read by Mr. Hooper, on—"*The results his experience in the practice of several pre-ative processes* :"—

Iaving recently been occupied with a series experiments to test the value of certain pro-ses for out-door photography, that have been ught before the public with considerable ensions to excellency, I think it may not be cceptable or unprofitable to place the results ore the present meeting. Those that have efly occupied my attention are the dry collo-n processes of Mr. Barnes, the gelatine pro-s of Mr. Long, baked dry collodion plates, l a few others.

have carefully tried the process as published Mr. Barnes, and the result in my hands has been satisfactory, only being able by it to ain a good negative occasionally. The great ount of care required in every stage of the nipulation, will, I think, prevent its being nerally adopted. Finding these plates were t always to be depended upon, I commenced perimenting on the process of Mr. Long. The ccess I have met with from the first has con-nced me that that process will, ere long, be nerally adopted; the plates being easily and ickly prepared, and keeping well, is a great vantage.

I will briefly enter into the details of the ocess, and then develop the four plates before u, three of which were exposed yesterday. ie remaining plate I purpose printing on in ur presence, in order that you may see how a ansparent picture is produced by gaslight.

I have tried various sorts of collodion for this ocess, and find none answer so well as a very d and thin collodion not over iodized. The m on the plates I am to develop is so very ansparent that it would seem almost impos-ble to obtain intensity on such. We shall e, however, that such is not the case, for any nount of intensity can be obtained with that ansparent film. If a thick collodion be used stead of the kind I have just named, a blister-g film is likely to be produced, and which will robably disconnect itself entirely from the lass before the development can be completed. n carrying out my experiments respecting the ollodion necessary to ensure freedom from isters, I have found that almost any negative ollodion will do if treated in the following anner :—To one ounce of negative collodion made from gun *cotton*, that made from gun aper not answering so well) add half an ounce f æther and half an ounce of alcohol, and of iodine dissolved in alcohol sufficient to make the collodion a very dark colour; a small bar of zinc immersed in this for some hours will make it colourless, and admirably adapted as a substitute for old collodion. Almost all the different collodions I have treated in this manner have passed from the contractile to the powdery or porous kind. With respect to the manipulatory part of the process, it being the same as for wet collodion negatives up to coating the plate with the gelatine solution, it will be unnecessary to describe it. The gelatine solution* I prepare and apply as directed by Mr. Long in his treatise on the subject.

If applied warm upon a thick film, there is not that tendency to blister as when used cold; but with the thin collodion made as I have before stated, there is no tendency to blister, even when used cold. This solution should not be prepared many days before wanted, the results not being so good if kept above a week. Before removing the plate from the sensitizing bath, it should be raised and lowered several times, to get rid of all appearance of greasiness of surface; when taken out it should be slightly drained, and the preservative solution poured over it, beginning at the extreme edge of the plate, and made to flow to the opposite edge, carrying all the superfluous silver solution before it; let this run off the plate into the waste pan or sink; a fresh supply of preservative solution is then poured on and off several times, taking the precaution to run it off at a different corner of the plate each time, so as to bring every part of the sensitive surface under its influence.

I should have stated it is necessary to wipe the back of the plate with blotting-paper when removed from the nitrate bath, to prevent any solution running down and mixing with the gelatine solution afterwards applied. I find the exposure required for plates preserved in this manner is nearly one-third longer than for those prepared by the collodio-albumen process. The development of the picture may be deferred for several days after being exposed; in many other dry processes I have found the plates required to be developed the same day as exposed. I cannot state how long this part of the process may be deferred, having only kept them five days, the results then were as good as those in which the whole of the manipulations had been completed the same day.

Before developing, the plate must be soaked in water, to remove the gelatine on its surface; this takes from two to five minutes; when the gelatine is got rid of, place the plate in a saturated solution of gallic acid, to which has been added from three to six drops of a thirty grain nitrate of silver solution—the development takes from twenty minutes to an hour or two, depending on the amount of exposure the plate has received. The advantage of employing gallic acid without the addition of pyrogallic, is, should the exposure in the camera have been too short, the solution does not decompose, however long the development may be continued; another advantage it possesses is, that should a thick collodion have been used

* The meta-gelatine solution is Mr. M. Lyte's.—Ed. L. & M. P. J.

and blisters formed thereby, I find when the plate is finished and dry, there is no appearance of blisters having been on it; had pyrogallic acid been mixed with the gallic, and decomposition taken place, every blister would have been visible on the plate after drying.

Those of you who have read the work on this process, published by Messrs. Bland and Long, will perceive that I do not differ materially from the formulæ therein named; the only difference I have made is to use a very thin collodion, and to develop with a saturated solution of gallic acid, instead of gallic and pyrogallic mixed, and with a less quantity of silver solution added to it than is there recommended. Having described this process, I would state—any person who can work the negative process with wet collodion, will be certain to succeed with this.

Before concluding this paper, I would say a few words on another process, which was published about two years since, and which I have employed during that time with much success; I allude to the collodio-albumen, which, for rapidity, excels every other; the exposure in the camera takes from two to three times that required for wet collodion plates—one operator gets a more sensitive surface than another, caused by the different manner in which the plates are dried, a plate dried spontaneously, or at low heat, being more sensitive than one dried at a high temperature. The cause of the great sensitiveness of collodio-albumen plates, as compared with others, is, I think, to be attributed to the formation of the double iodide produced in the film when the albumen (containing an iodide of any kind) is poured over the iodide of silver on the plate; it is not necessary to employ collodion as a base; I have found a layer of iodized-albumen answer the purpose, and to be equally as sensitive;* what is required is, some body to retain the iodide of silver on the plate, for the iodide in the albumen to act upon. I have floated iodized paper on albumen prepared for the collodio-albumen process, dried it, sensitized, washed, and again dried it; it answered the purpose and required less exposure in the camera. In all my experiments with paper, (substituted for the collodion,) I found the picture visible when the paper was removed from the dark slide. The extra sensitiveness may be the result of the roughness of the paper surface; in order to satisfy myself on this point, I albuminized some paper for positives (the albumen containing eight grains chloride of barium to each ounce); I also coated a plate with the same albumen, when printed on; the chloride of silver on the paper was acted on more rapidly by the light than that on the glass. As in the collodio-albumen process, the plates having to go through so many operations, are very prone to blister, and during hot weather, if kept a few days, generally turn brown, it is not surprising that so many try to find a substitute; of all, that have yet been brought before the public, none can be compared to that of Mr. Long, the plates are so easily prepared, and certain of producing good results.

During the reading of the paper some excellent specimens were shewn, and several negati most successfully developed.

A vote of thanks having been accorded Mr. Hooper for his essay, the proceedi terminated.

The next meeting will be held on the sec Thursday in November.

* Mr. Talbot discovered this fact, and availed himself of it in his rapid process.—Ed. L. & M. P. J.

ON THE FADING OF POSITIVES.

By the Editor.

We promised to remark upon Mr. Sutt paper on the fading of positives. If reader will now take our last number in ha or No. 36 of the present volume of *Photogra Notes*, he will the better follow our remai The subject is an important one, and we glad to have an opportunity of discussing It is a matter which certainly ought not to left in so unsatisfactory a condition. In Fra it has been proposed by some timid individu to avoid all allusion to the question, for fea prejudicing the public! We in England like know the worst of a bad business, and wo not tolerate a journal that would make thi pleasant outside when all was supposed to rotten within.

We are about to review Mr. Sutton's pa chiefly because we take more interest in t question of fading than in any other relating our art. Something must be done. Anot year must not pass without an earnest pub discussion of the whole question. Already t retailers of photographs admit that peo admire, but do not buy *extensively*, of photograp solely because they have no guarantee that print for which fifty shillings is asked may become waste paper in a few months. Is this the literal truth? We avow that we o selves abstain from the purchase of a tempti subject, because we do not know the history its manipulation. We have seen one of the lar continental photographic workshops, and we clare that we have no faith in pictures *prepa for the market* in the off-hand way we have w nessed. We believe that more pains are n being taken, but this, like many other questio is one of degree, and who is to say where t line is to be drawn.

Mr. Sutton's first paragraph is imperfect. have photographs which fade without formi a coloured substance. We shall have classify faded pictures according to their min physical appearances.

Certainly a pale yellow image is no longe true photograph.

We have no proof of the exact nature of t yellow substance, and we do not believe tha is permanent against all time and nat agencies. Dr. Percy spoke of a sulphide silver dense enough to form a good picture: could not mean that a scarcely visible fi suited any subject pictorially. Why must say that it is only the assumed yellow sulph of silver that is permanent? We know nothi precisely about the comparative merits of bl and yellow sulphide of silver. There is so confusion here.

Not *the* process of fading, but *a* process fading, can be shown by the sulphide of amn nium. This toning and fading process is of discovery, and if it be worth having it is righ

s. The action of "hydrosulphate of ammo-" was unknown to photographers till we de our experiments. Mr. Shaw is the only ly photographer besides ourselves who tested action of a sulphuretted compound, and *imunicated to others* the result. The manner which sulphide of ammonium acts is yet explained. Saying it is due to an excess of phuration tells us nothing; it may be the dation of a sulphuretted compound which lerates the destructive substance: even a *osulphite* may be formed, and be partly the use, but no one would call this an excess of phuration. The best way is to say that we not know the steps taken by the respective ments which exist in and about the picture. e "hideous" colour of a newly fixed photo-aph may be removed by heating strongly a mp photograph which has a trace of hyposul-ite left in it. Is this sulphuration? It may so; but if so, sulphuration need not cause a otograph to fade, for we have *toned* pictures the date of 1844, which have not faded, though pt in an ordinary book. Hydrosulphate of imonia, as sold, is a very uncertain substance. e have in this journal explained the mode of eparing it: it will be seen that it is not likely be uniform in strength. Besides it is acted on by the air if kept in an imperfectly stop-red bottle. Hyposulphite of ammonia is said be formed by the action of the air, so that less care be taken the experiments will be gue.

This sulphurating to a maximum is an assump-n, and Mr. Sutton is doubtless too good a gician not to know that "what is gratuitously sumed, may be as gratuitously denied." iat sulphur toning takes the picture on the id to destruction we admit, but it does not low that a man will go the whole course cause he sets out dangerously. Keep the ned picture from a smoky, toning *atmosphere*, d it may stop on the road unharmed. We lmit that the sulphur toning is an obscure atter. We have old toned prints which are ill good, and that constitutes our stumbling-ock. If gold tones *without sulphur*, let us use old, but do not let us therefore say that a ilphur picture must fade and a gold toned cture is permanent. We simply know but ttle about it.

With regard to the influence of organic matter the fading, we are also tolerably ignorant. Ve are glad that Mr. Sutton has discovered that ven the developed pictures may not resist ilphur. We, long ago, faded one of his "per-ianent prints," with sulphide of ammonium, in ie presence of several chemists. We know of o permanent prints. Permanent prints are ke the indelible marking ink, which the quick-itted French chemical student converted into delible ink," by a touch of cyanide of potas-ium and iodine, or some such agency.

Without pretending to know the nature of he hideous brick-red image, we may say that ve think the organic matter about it does render t less stable, but we must not build on a mere ypothesis, let us say we do not know all the acts of the case.

Now for more suppositions. We once, in onversation with Mr. Talbot, asked, "may we not suppose, &c.;" to which he good-naturedly replied, with a smile, "You may *suppose* anything you please." We felt the rebuke. There was no need to add—supposing proves nothing. But seriously, this matter is too grave to allow of any loose chemistry being brought near us. It is a rule in chemistry to ignore the existence of any oxide or sulphide which cannot be shown by analysis to exist, and this is a safe rule. We know that we have much to discover, but we cannot therefore allow the justness of any mere assumption. The onus of proving the existence of a bisulphide of silver rests with Dr. Taylor and Mr. Sutton. Any one may utter guesses, and give a chemist a twelvemonth's work to demonstrate their futility. This is not said to discourage speculation, but to point out the weakness of reasoning from mere surmises. What is it then? Why, it may be one of five hundred things not yet dreamed of in our poor philosophy! Has it been shewn that the yellow compound is or is not an allotropic substance? Here is more mere guessing.

We would ask Dr. Taylor to produce, chemically, this yellow double salt. The equivalents of sulphur and silver are known, and hydrogen can easily be oxidized. Can water be obtained from this yellow salt by the oxidation of its hydrogen? These are questions that we ought not to be asked to solve.

The explanation of a theorist is often satisfactory enough, if we will only "adopt" his "notion;" but here lies the difficulty. We may adopt a thing that is false. Again, we say, the onus of proof lies with the theorist. Form this yellow sulphide, and we will gladly analyze it.

In our time, we have had the notion that a sulphate might be formed, but we have long left off guessing, and determined to wait for more light. We have proved, by experience, that a positive, faded by iodine, can be very fairly restored by boiling it in potash; but a positive, faded by time, is not so restored. From this we do infer that the ordinary fading is accompanied by the formation of a soluble salt, for what little restoration takes place is of a blurred character in the one instance, and of a well-defined character in the other. This is reasoning from experiment.

The mode of analysis suggested would not prove that a sulphate had been formed. A hyposulphite *might* be formed; so much for hypothesis. Moreover, testing is not so easy as one might imagine; *traces* of sulphur salts are difficult to analyze *qualitatively*.

The remarks about light and darkness are vague; we do not understand the facts well. Theory about fires is very loose. Sulphur exposed to damp air forms sulphuric acid; this would dissolve the silver, not sulphurate it. See how loose this is. We talk about sulphur and sulphuration in a very vague way. Mr. Sutton is not alone in this respect.

Sulphur, as sulphate of lime, is wilder guessing still. Show us that sulphate of lime can blacken, or in any way sulphurate silver. As to sulphide of sodium, ultramarine is never put into cream coloured papers, which yet yield fading pictures.

We believe the sulphur compounds, in an impure atmosphere, have much to do with

certain cases of fading, and we believe and know that a red picture will tone itself in the atmosphere, but not with gold certainly: with what then, but sulphur?—and if a print can tone by atmospheric sulphur, why cannot oxidation and more sulphur destroy this self-toned print? Let not this point be evaded. It is with us a strong position, and we wish we could be fairly dislodged from it. As to the removal of all traces of sulphur, we used potash with a view to aid in this matter, and we have still something to say about the use of potash; but we shall follow our own prescription and not talk about matters which only may or may not be founded in realities. The difficulties of analysis are very great where such minute quantities are concerned, and one had need give themselves up entirely to the subject or thing, not always practicable in this world of mixed duties.

The *chance* of prints, made by the ordinary method, lasting, is this: certain prints made in a wholesale way in 1844 have, as regards some of them, remained without the slightest deterioration to the present day; indeed, one might affirm that some of them have been *temporarily* improved. This, again, is a strong position, and we can never retire from it as long as these said prints remain in their present satisfactory condition. We say that any theory that fails to explain *fully* this fact still leaves us in the dark. Do we then confide in the old method? By no means: but we point to it to warn those who think they prove everything by saying, "here is a picture fourteen years old *by my process*, and it is unfaded." We reply, "here is one as old as yours, by the original process; and if one escapes why may we not learn how to enable all to escape?" You reply, the majority of yours fade, and the majority of ours stand good. Granted for a moment, and only for a moment; but your process is inferior in its results, and may yet require to be kept from the atmosphere; and so we may as well begin by protecting the superior results obtained by the old and unexplained method.

The honourable course is to admit that we are very ignorant in this matter, and to tell the public that they must share with us in it. We will do our best, according to our knowledge, and having before us the fact, that pictures of old date are still sound, we are not justified in asserting that any given picture will fade because it was not made by our process.

The difficulty is to furnish the guarantee. Self-asserted authority is valueless in the long run. The matter must be settled with the public, and not simply by them or against them.

We believe we have now as fairly as possible arrived at Mr. Sutton's last paragraph; and as his remarks have been somewhat desultory, so is our comment. He ends by deprecating the use of hot water in fixing. Now, the chemist knows, that when he can use hot water to wash a precipitate, it is to be preferred, and on this ground we advocate hot water for washing, say water at 100° Fahr. We believe that the washing is accelerated by using a hot liquid, apart from any question of solubility; at all events, if probabilities are to guide us, cold water must be considered inferior to hot: th question is important, though to many it ma seem to be only secondary.

If, in our remarks, we have said anythin that may appear to mar the general charact of our criticism, we beg that it may be ove looked. We desire to obtain credit for being i earnest in this matter, and we are very gla that Mr. Sutton's fearlessness has given us th opportunity of assisting to keep alive the di cussion of this fundamental question. In justic to ourselves, we ought to add that the whole our remarks have been noted down with "running reed," and without time for minut revision; but we do not by this, wish to impl that we doubt the truth of the positions w have taken up, but simply beg of the reader t excuse the manner in which we have procedec

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Apparatus for Washing Positives.—A the meeting of the Norwich Photographi Society, on the 2nd ult., an ingenious apparatu for the purpose of washing positives, was exh bited and explained by Mr. Thompson. It co sists of a gutta-percha tray, about thirty inch in diameter, into which the prints are placed this tray, which is large enough to wash fift stereoscopic prints in, is supplied with water fro a horizontal pipe, having a siphon-shaped ben at the end to allow of the water flowing into th tray in a perpendicular direction, and provide with a stop-cock worked by a long rod instead the ordinary thumb-piece for turning the plu The tray is provided with a siphon whic empties itself into a small tin bucket, thre inches in diameter, open at the top, and havin a small hole at the bottom; this bucket i attached by a jointed piece to one end the long rod before alluded to, while at th other end is fixed a balance weight. Upo turning the supply tap the water flows throug the horizontal pipe and stop-cock into the tray and when nearly filled the siphon begins to ac the water running through into the bucke which, as it fills, becomes heavier and sink down, turning the stop-cock and shutting o the supply of water. The siphon acts until th tray is empty, after which, as the bucket be comes empty, the water running through th small hole at the bottom, the balance weight o the other end of the rod falls down, and opening th stop-cock again allows the water to flow into th tray, which is thus kept alternately filling an emptying as long as the supply of water fro the main tap lasts, without any attention bein required. We should observe that a piece perforated gutta-percha is fixed across the en of the tray in front of the siphon, to preve the prints from stopping it up. The invent conceives that considerable advantage is to derived from this invention; its action far superior to a continuous stream, as there i the certainty of getting a perfect change of th water each time the tray is emptied, which ma be as often as three hundred times in the spac of twelve hours; and the prints are not liab to be doubled up and damaged against the sid of the tray as when a continuous stream is use being by this invention kept constantly in rotary motion, except during the few second each time the tray is emptied.

AMATEURS' COLUMN.

PAPER FOR PHOTOGRAPHY.—We shall, for the present, bring this subject to a close, having pointed out all that is known with certainty respecting the best materials for ensuring a good sheet of paper. Besides the negative paper made of linen, we had some paper made for positives, by the advice of the manufacturer, and for this a material called *government canvas* was used It was a fine kind of sail-cloth, and made a very strong paper. Some positives printed on it at the time are good to this day, although they have been kept in a portfolio with others which have faded. I am inclined to think that the nature of the paper has something to do with the fading of positives. The facts stated by Mr. Ross respecting hard-sized paper is, in accordance with our experience, gained from the printing of Mr. Talbot's pencil of nature; but then all pictures on this hard-sized paper have not stood the test of time. We are in this subject met by such conflicting evidence that a sound observer must hesitate in assigning any one cause as *the cause* of fading. The removal of the size from the finished prints has been recommended; but against this we have the fact, that pictures with the size in them, in a very insoluble condition, remain good, when others, on a paper feebly-sized, fade altogether. So far am I from fearing the presence of good size that I have recommended sizing the picture anew, after a solution of potash has been used to tone the picture. Time alone can tell us who is right in this matter. If size is injurious, what shall we say of albuminized prints? The size may effect us this way: it may either aid or check, as the case may be, the action of certain atmospheric impurities, but we have already said the paper question requires a searching investigation. There are a few miscellaneous points which remain to be noticed respecting the paper manufacture. First, as to the presence of spots which appear in the finished picture. These, of course, arise from the presence of foreign substances. Particles of iron or brass may be present from the rag-sorters overlooking covered wire, buttons, &c., even pins are sometimes overlooked and go into the engine to be beaten in with the stuff; bone buttons, hooks and eyes, and such-like fastenings often pass into the pulp; and if they are not torn to pieces completely, they abrade the brass bed of the engine sufficiently to introduce particles of metals into the pulp; these particles decompose the silver solution and furnish wide-spreading spots. Our linen paper became foul from a peculiar cause: the water of the spring which supplied the engine contained a certain quantity of carbonate of lime held in solution by free carbonic acid. This lime became deposited upon the wood-work of the vat (and indeed upon every part of the wood-work exposed to the water) in consequence of the expulsion, by constant agitation, of the loosely combined part of the carbonic acid. This deposit, after reaching a certain thickness, sometimes scales off during the beating operation, and becomes broken into a thousand pieces, and is interspersed throughout the pulp, and this happened to us. At the outset I objected to the presence of this deposit, but I was told that it could not be removed; and, indeed, to remove it would be no easy task: it adheres so closely to the wood that the scales bring away an impression of the grain of the wood. The deposit is, moreover, very hard. Again, the paper may become foul from the felts having been carelessly left exposed to dust and dirt, and washing is here not a sufficient remedy. The felts used for our linen paper were unfortunately, as it turned out, in a dirty condition; being finer than those usually employed, they had lain by and contracted dirt which no washing could remove. These felts were actually cleansed at the expense of our linen paper!—a most provoking piece of experience, for which the maker was in some degree to blame. Another source of impurity may be found in the bleaching house. I have seen, at a very large establishment, metal pipes and taps projecting over the wooden vats which contain the pulp and chloride of lime; and I have seen these taps green and corroded from the chlorine vapour condensing in the water which was leaking out at bad joints and running into the pulp, carrying with it chlorides of the metals used in the pipes and taps. I think I have now stated quite enough to justify the assertion that the process of manufacture must be remodelled if we are ever to get paper pure and uniform in its character. I may also mention that I suggested that distilled water might be necessary for washing the pulp and for sizing, but I was, at the time, assured that the suggestion was impracticable. Now, however, there is an admission made that distilled water may be had at an economical rate. Indeed at present all the water used at the Faversham powder-mills in refining saltpetre for gunpowder is distilled expressly from large iron stills, and all the water used in the actual manufacture is carefully distilled, as I was informed on visiting the works, yet gunpowder is cheap enough, this nicety notwithstanding.

I propose next to give the method employed in printing the plates used to illustrate the pencil of nature. M.

THE REFLECTING STEREOSCOPE.

THE following note by Professor Wheatstone, although read before the London Society some four years since, has not yet found its way into our pages. A recently published *Essay* having described the reflecting stereoscope to be an obsolete and unmanageable instrument, we are the more anxious to direct attention to the various modifications of the original invention. We can assure our readers that the reflecting stereoscope will never become obsolete, or be "*merely confined to the experimental purposes of the philosopher*." Such a fate is much more likely to attend the rash assertions of the writer of the essay alluded to above.

"The most perfect and generally useful form of the steresoscope is that with reflecting mirrors, described in my earliest memoir 'On Binocular Vision,' published in the Philosophical Transactions for 1838. Pictures of any size may be placed in it, at the proper point of sight, with the proper convergence of the optic axes, and it admits of every requisite adjustment to make the pair of binocular pictures, coincide correctly.

"I have described, in my second memoir, a portable stereoscope which folds into a small compass, and which is well suited for pictures not exceeding six inches by four. I have since constructed an instrument, very convenient for carrying about, which is adapted to exhibit pictures of the largest dimensions usually taken, as well as smaller ones, and which may be made use of either for mounted or unmounted pictures. When closed it occupies a space of nine inches in length, five in breadth, and four and a half in height; when expanded the instrument is two feet in length, one foot in height, and nine inches in depth. The base and sides consist of jointed bars on the principle of the lazy-tongs; the two mirrors fold together back to back, and, by means of a hinge on their support, fall into a groove on the base fitted to receive them. On the top of each of the expanding sides a clip nine inches in length receives the picture (which there is no need to mount on cardboard) and holds it by the pressure of a suitably disposed spring; and a similar but detached spring clip is applied to the lower end of the picture in order to keep it flat and in a vertical position.

"The pictures being fixed in the clips, so that their reflected images shall appear single and coincide in all their parts, the accurate adjustment to the sight of different persons is effected by sliding to and fro the pillar which supports the mirrors; the optic axes being caused to converge more as the mirrors are moved towards the eyes, and *vice versâ*. As the height of the sides is variable through every degree, the pictures, are easily adjusted to the same level by pressing on the side which is highest. The length of the base being also variable, the pictures if it be required, may be placed at different equal distances from the mirrors. If the pictures are not straight with respect to the sheets of paper on which they are placed, one end may be brought lower than the other merely by drawing down that end so that it shall not enter the clip so far as the other.

"The instrument is furnished with a pair of ordinary spectacle lenses, No. 24. If the pictures were so placed that their reflected images coincided when the optic axes made an angle of 15°, corresponding to the distance of twelve inches, no lenses would be requisite, as the distance of the binocular image, the convergence of the optic axes, and the adaptation of the eyes to distinct vision would have their customary correspondence. But, for reasons I have elsewhere stated, a much better effect is produced, and the objects appear larger and more distant, when the pictures are so placed that, to cause their most distant corresponding points to coincide, the optic axes are parallel, or nearly so; in this case, however, in order to see the objects distinctly, the rays proceeding from them must be rendered less convergent, and for this purpose lenses are necessary.

"The lenses are moveable in a vertical direction, in order that they may be fixed at the proper point of sight; the effect of a stereoscopic picture greatly depends on its being thus viewed, though it is a circumstance which is very generally disregarded."

THE BIRMINGHAM SOCIETY'S EXHIBITIO[N OF] PHOTOGRAPHS.—We are glad to hear that [the] Exhibition has met with so much sup[port,] there being nearly eight hundred diff[erent] specimens of the art here collected, [many] of which have been contributed by the [first] photographers of the day. But we r[egret] that while such efforts have been mad[e to] secure a collection of great excellence, a [want] of apathy has been evinced by the people o[f Bir]mingham by no means encouraging to the [pro]moters, as we believe that the receipts hav[e not] met the expenditure. While exhibitions [have] generally failed in a pecuniary sense in [other] towns, we did think that in a place like Birm[ing]ham, deriving so much assistance from the [art,] better support would have been awarded to [a col]lection of this character; for we conceive i[t a] place where photography should be st[rongly] and warmly supported, believing, as we do, [that] in all probability it is an art which, ere [long,] will be applied in a variety of ways hit[herto] unthought of, to the advantage of the tow[n in] the embellishment of articles for the manufa[cture] of which Birmingham has so long held a w[orld-]wide reputation. In connexion with the [Exhi]bition an "Art Union" has been formed w[hich] has met with a fair share of patronage, [every] subscriber being guaranteed a picture of the v[alue] of two shillings, with the option of choo[sing] any picture in the collection upon paying [the] difference in price between the amount o[f the] prize and the value of the picture selected.

ARCHITECTURAL PHOTOGRAPHIC ASSOCIA[TION.] —This newly-formed Association is procee[ding] with vigour. With the view of enlisting [pro]vincial aid in carrying out its objects, a cir[cular] has been forwarded to several of our lea[ding] Societies, inviting co-operation. Arrangem[ents] have also been entered into with the lea[ding] photographers—both English and continen[tal—] to form the most extensive collection of a[rchi]tectural photographs ever yet brought toge[ther.] We believe it is intended to exhibit, ear[ly in] December next, this immense collection of [pho]tographs in London, to which the membe[rs of] the Association—now numbering nearly [.00] subscribers of one guinea and upwards—[will] have free admission, and be allowed to ch[oose] such pictures as they please. Amongst [the] collection will be found, we believe, some o[f the] finest specimens of architecture of va[rious] nations, including Italy, France, Belg[ium,] Greece, Turkey, and the Mediæval archite[cture] of our own country. All well wishers to [art-]education will be gratified to learn that [the] active co-operation of several public de[part]ments is being offered to the Association,—[and] ere long it will assume a position which [will] be as gratifying to its early promoters [as] useful in promoting the love of architec[ture] amongst the whole population. To enabl[e the] Association to carry out its objects wort[hily,] the Secretary, Mr. Hesketh, will be gla[d to] receive the names of subscribers throug[hout] the country. The office is at 95, Wimpole-st[reet,] London. The Liverpool Honorary Secreta[ry is] Mr. C. O. Ellison, of 33, Bold-street, wh[o is] authorized to receive the names of subscri[bers] here.

MR. SUTTON'S CHALLENGE.*

ING inserted Mr. Mullins' letter, we insert Sutton's reply, and a rejoinder by Mr. ins:—

R,—I beg leave to offer a few words of reply to ter which appeared in your last number, headed . Sutton's Challenge," and signed "Henry lins."

Mr. Mullins will have the goodness to turn to 23, page 104, of my "Photographic Notes," which he is a subscriber,) he will find in the nd paragraph the following remarks:—

I have only seen two faded prints by Blanquart-ard's process, and these have rather been des-ed than faded. They belong to a Daguerreotypist his island. The image has evidently been verted into iodide of silver by the destructive es of the iodine which escapes from his dark n; some prints of Mr. Fenton's have been des-ed in the same way, by the same cause. One it, however, by Blanquart-Evrard, which was tected by some means, has escaped, and is as h as ever: it is six years old."

need scarcely inform him that *he* is the Daguer-ypist alluded to. I have worked for a week at rooms, with his bromine and iodine boxes, and emarked that they allowed a good deal of gas to ape. His room, which is large and in an airy ation, ought not to smell so strongly as it always s of these gases; in fact he is obliged, all the r round, to keep one of his three windows wide n. I need not inform your readers that the mide of iodine is recommended in Blanquart-rard's treatise, as a means of removing silver ins; and that the fumes of bromine and iodine destructive to paper photographs. I may ntion that Mr. Mullins selected the prints he t you from a dozen or more which I showed him, l that the remainder are in my possession and as d as ever.

I have now disposed of what he has politely led my "mendacious assertion."

With respect to M. Le Feuvre's print,—I have t seen it, nor do I think it likely that he would hibit a faded print in his window; but I will make quiry about it and let you know the result.

With respect to my repeated challenges to photo-aphers to produce a faded print from Blanquart-rard's establishment, I beg to say that during e year 1856, I sent from Jersey upwards of 9000 ounted prints, each bearing the stamp of "per-anent photograph" at the corner of the mount, d that not one has been returned to me as faded. ach of these prints may be considered in the light an unanswered challenge.

During the whole course of my experience, I have en no faded prints from Blanquart-Evrard's tablishment, except those which Mr. Mullins sent u, (and of which, you observe, I informed the aders of my "Notes," months ago,) and very tely another among my own collection, the exist-ice of which I do not wish to conceal. It is ossible that among the subscribers to my Album ere may be good-natured persons who may ossess faded prints, but who have been unwilling make me acquainted with the fact. But in the sence of any such evidence, I must still hope that hotographs which have been developed on iodide f silver, and properly treated, *are* permanent; for *very rare* and *occasional* failure may fairly be ttributed to an accident of some sort. If they are ot, then the whole system of photography, with he salts of silver, must fall to the ground, for this s the process by which *negatives* are obtained. I epeat, that the fate of the present system of photography depends on the permanence (not of my printing establishment in St. Brelades Bay, as Mr. Mullins would facetiously make out), but of Blanquart-Evrard's positive print.*

September 29th, 1857. THOMAS SUTTON.

POSTSCRIPT.—I went to M. Le Feuvre's yesterday, in company with the Rev. T. M. Raven, (a member of the Photographic Society of Scotland,) to examine the print alluded to by Mr. Mullins. We agreed that it had not faded in the least degree. M. Le Feuvre received it, with a number of others, from Blanquart-Evrard, sound, about three years ago, and he allowed us to look over the remaining prints which came in the same parcel. All are as fresh and perfect as they were on the day when he received them; and he says he has never seen a faded print from B.-Evrard's establishment, although he has unfortunately in his possession many faded prints by other artists.

I beg, therefore, to contradict the statement made by Mr. Mullins in the fifth paragraph of his letter.

I ought to mention that, when Mr. Mullins first showed me the damaged prints which he has sent to you, we had some conversation about them, in which I attributed their having perished to the action of the destructive gases which are always present in the atmosphere of his room, but particularly at night, when the doors and windows are closed. Why did he not, in common fairness, mention the circumstance of my having given him this explanation?

As you have permitted his letter to appear in your Journal, I trust you will, as an act of justice to me, insert my reply in your next number. It is the only communication with which I shall trouble you on this subject, for Mr. Mullins has so far forgotten himself, that I decline entering into any further controversy with him.

* From the *Journal of the Photographic Society*.

* (?) Mr. Talbot's original "*calotype*" *positive print.*—ED. L. & M. P. J.

MR. SUTTON'S CHALLENGE.

SIR,—In the current number of "Notes," No. 37, Mr. Sutton, in referring to my letter in the last Journal observes that he *has* publicly acknowledged having seen the three faded prints I mentioned in my letter, and then, with the confidence natural to him, says, "the first part of Mr. Mullins' letter is disposed of"—how he jumps to this conclusion I am at a loss to imagine. The paragraph I alluded to, as appearing in the "Notes," said that Mr. Sutton had repeatedly challenged the world to produce a faded print from Blanquart-Evrard's establishment, and that, as he had never had any reply, we may conclude, &c.: thus in as plain language as possible ignoring the fact of my having shewn him the three *which have faded*, and were sent you at the time I wrote; and I think that his method of disposing of the first part of my letter is merely a confirmation or what I said, viz., that Mr. Sutton *had seen* the prints; his having mentioned that fact in a former number of the "Notes" is nothing to the point. He said deliberately that he had never seen a faded print from Blanquard-Evrard's establishment, and I reminded him that he had: but perhaps he thought that as he had mentioned them in No. 23, page 104, *they were* disposed of.

Now, as regards the print at Le Feuvre's, which I said was hanging in the window, palpably faded at the time I wrote, and which Mr. Sutton now asserts (in capitals), was not; I must say that that assertion is "intemperate," for that print was *not* amongst those examined by him and his friend, the Rev. Mr. Raven, at Le Feuvre's, on the occasion he mentions, because before the appearance of my letter in your Journal, I missed the photograph from the window, and on enquiring about it was

told that it *had been sold*, to whom they did not know; however, I am glad to be able to say that I was not the only one who thought it likely to be a bad investment.

Then, with respect to the charge of arrogantly claiming for the printing establishment at St. Brelade's Bay, the future of photography, which Mr. Sutton disposes of by saying that he has always frankly brought forward in the "Notes," the different processes of printing, such as those of Sella, Pretsch, Poitevin, &c.; I for one have no wish to deny; it was matter for his "Notes;" but as a set-off, can any of his readers say that advantage has not been taken of every opportunity to bring in Blanquart-Evrard and "Hollingworth's thin paper?"

In conclusion, I only remark, that unless Mr. Sutton employs some better argument in the letter he requests you to publish than that we have been favoured with in the "Notes," *the facts*, with all due deference to him, remain as they were.

HENRY MULLINS.

Royal Square, Jersey, Oct. 13th, 1857.

CORRESPONDENCE.

COLOURING OF COLLODION POSITIVES.

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—First make a small book about six inches by four inches of middle rough drawing paper, and of sixteen or twenty pages; on each page put a small quantity of dry colour out of the bottles, (I prefer "Manson's colours;") on the first page put white, then fleshe olour, then the colour for lips, &c.—in fact so contrive the book as to have the colours most required nearest at hand; now get assistance to make a neat black velvet case, "with a pocket for pencils;" this will serve to hold the book and to colour the picture on. When not in use put the book in a packet by itself, to preserve the colours from dust and dirt: about seven pencils will be enough, four camel's hair and three sable. Newmans, of Soho-square, keep these pencils very good, and made with short hair on purpose. Having your "fixings" all ready, proceed as follows:—With a camel hair. give a general flesh tint over the face, according to the complexion, then bring up the colour of the lower part of the cheeks with carmine; now, with a sable, mix a little flesh tint with white and yellow, or orange, and touch lightly, the upper part of the cheek, the ridge of the nose, and the centre of the forehead; then, with another sable, give smart clear touches of purple on the dark side of the face, under the chin, underneath the eyebrows, by the side of the nose, and wherever the shadows fall—vardyke brown will now be useful on the hair, "if light complexioned," and on deep shadow in the face. The background must be suitable to the portrait; in general, purple grey and brown are the colours used, with a *little* greenish grey tint near the face, to lower florid complexions, and pale blue grey near fair ones; the colour must be worked much deeper near the lower part of the picture, and gradually softened off towards the top: a little *finely* powdered rosin may be used in the background, but it requires great care, or it gives the picture a patchy appearance. Now put in the gold chains, rings, pins, &c., with shell gold and water colours, and use as *little as possible*, and shade with burnt sienna; do not use much Chinese white on shirt fronts, lace, &c., it only destroys the "keeping" of the picture, and makes the bad tone of it more conspicuous: great care must be taken in colouring the eyes or the likeness will be lost.—Yours truly,

Fisher-street, Swansea. THOMAS GULLIVER.

P.S.—You will see by "LILLYWHITE's" letter, that he refers to recipe No. 1, *not* No. 2.

[We shall be happy to receive the further information T. G. kindly offers.—ED. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

MR. SMITH, of Tain, sends us a very good colo[ured] positive photograph, which is upon black [...] We have seen French and American specime[ns of] the same class, and certainly this one is entitl[ed to] praise. The whites are clear, and the half [tones] good. Pictures of this kind can be readily se[nt by] post; but should have a stout card inserted to [protect] them from injury. We may add, that a b[...] varnish would harden sooner than the one [...] employed. In the formation of the image the pi[cture] is very successful.

LILLYWHITE.—We promised to notice a lett[er from] Lillywhite, which a contemporary has been g[ood-] *natured* enough to publish and comment u[pon.] Lillywhite sent us a letter which was *anonym[ous]*, and which contained nothing but censure, direct [or] implied. This letter we were requested to pu[blish] in our next! It was just such a letter as a *g[ood-] natured* friend (Mr. Sutton will know what we m[ean]) might send to test the acuteness of a young h[...]. Besides, even had the letter borne a real signat[ure], what *friend* would wish you to exhibit your str[...] in the market-place? Could he not be content [with] inflicting them? But in reality we were hi[ghly] *amused* at Lillywhite's expecting us to print [his] letter. We ask Mr. Sutton would he have trou[bled] himself to print such a letter, it being *anonym[ous]*; and if not, why has he meddled in the matter? [On] reflection he will see that he has done wrong; [and] his readers, if they chance to see this, will de[cide] that Lillywhite was very properly treated.

CONTENTS.

Printed by the Proprietor, HENRY GREENWOOD, of No. 14, Fairfield Crescent, in the Parish of West Derby, at his O e, 32, Castle Street, Liverpool.—November 1, 1857.

THE LIVERPOOL & MANCHESTER
Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

NEW SERIES.] No. 22.—NOVEMBER 15, 1857. [Price 3d. Stamped 4d.

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 22.—NOVEMBER 15, 1857.

e London Photographic Society's first meet-, in their own rooms, took place on Thursday, 5th inst. There was a good attendance of nbers, and the evening passed away very eeably. We give prominence to this topic, ause we have a word or two to say respecting conduct of such assemblies. There should is much ease apparent on such occasions as onsistent with the dignity of a public body. have nothing at present very noticeable oring forward in illustration of our remarks, we fancy that our Parisian neighbours uld counsel us to adopt a little of their con-sational freedom in such matters. In the al Society, and in the Academy of Sciences, ertain formal gravity in the speakers as to ter and manner is allowable, and perhaps ential, although even in this respect our al Society is less popular in its tone than the demy of Sciences at Paris; but in a photo-phic society, which embraces so many classes pursuits, we should certainly find it to be an antage if we could import into the papers, ussions and comments, a phraseology less mical and professional than at present pre-s. Not that we would lower the scientific tensions of the body, but simply to supplement heavier statements with remarks of a more eral character, suited to a mixed assembly mateurs and professionals. A change in respect would give us more speakers, and s add to the variety of the evening's pro-dings; moreover, it would relieve those who daringly (or rashly it may be) rise up on occasions, and often simply because other-c there would be no discussion at all. With e speakers at command there would be ater aptness, conciseness, and regularity in proceedings. Those who could be useful uld be soon discovered, and there would be difficulty in so apportioning the time that greatest amount of good might be extracted of the greatest number in the shortest sible time. We should also have greater iety in the papers to be read. An observer ing expressed his views on a particular ject would, in the course of discussion, find himself bound to repeat his experiments, or to make them on a more extended scale, or in some way to modify them so as to give *them* their full usefulness, and *him* their fullest support. We offer these remarks simply with the desire of improving the usefulness of our societies' meetings. We do not think them out of place or out of time, and we commend them to the notice of all whom they may concern—to the managers, members, and visitors of the societies in London and in the provinces.

With the foregoing remarks in our mind we approach an interesting subject fully brought before the last meeting of the London Society. We allude to the papers on micro-photography, the substance of which we print elsewhere. We derived so much pleasure from being present at the demonstration of these papers that we feel as though any qualification of our praise would seem like cavilling conduct on our part. Still we cannot refuse to attend to our duty, and express our conviction that the papers would have been more generally understood *in all their details*, and of course have been (if possible) more appreciated, had the names and arrangements of the different parts of the apparatus been explained in less strict language, The use of the unexplained terms, "objective," "eye-piece," "sub-stage," &c., &c., gave apparent complexity to a beautifully-simple arrangement. Mr. Shadbolt has accordingly not done himself justice, through assuming too great a general knowledge in the auditory. Had he taken the time-honoured black board and chalk method of demonstration he could have made all follow him easily in his manipulation, by alternate appeals to a diagram and the working apparatus. The same observations of course apply to Mr. George Jackson's paper. Let us now venture, out of Mr. Shadbolt's own materials, to try to make his process more easy of apprehension, and, we may add, more thoroughly admired. To be sure we had the opportunity of watching closely his manipulation. The lamp, illuminating lenses, and negative to be copied were placed upon an ordinary flat-topped camera stand. (The whole arrangement is in the dia-

gram on another page, represented as placed upon a block.) *a* is the source of light; *b* is a thick short-focus lens to collect the light of the lamp and throw it towards the picture, where, from the convergence of the rays, the light would form rather too small a spot; the lens, *c*, is therefore interposed so as to spread the light out to cover completely the negative, *d*. The negative, for convenience sake, being pressed against a plate of glass by a spring; all in the plane at *d*. Now the end of all this arrangement is simply to give us a clearly illuminated picture of about three inches in size, which we proceed to reduce to microscopic dimensions by the microscopic *camera lens*, which is fixed in a tube at *e*; *e* being about the place of the "sub-stage" of the microscope. Our camera lens is, of course, of exceedingly short focus, for its ground glass or collodion film substitute is to be placed at *g*, which is the usual place for the principal stage of the ordinary microscope. Wood is here substituted for metal, because it is *here* that the sensitive film has to be placed to receive the image which the ground glass has aided us to find. Now let us look at the use of *f*, the only part remaining unexplained: *f* is the ordinary part of the microscope used to magnify anything placed at *g*, our collodionized film or ground glass substitute for example. Begin by focussing the microscope till the film at *g* is distinct, then turn the "fine adjustment" screw at *f* a little, to make a correction for the chemical focus, the amount being ascertained by experiment. Now leave the microscope with its final correction as it is, and look through it while, by the camera lens screw at *e*, you throw the *image* of the negative so that it shall be distinct to the eye, *as seen* on looking in the previously corrected microscope. All is now ready; remove the ground glass or its substitute, and put a slip of glass, collodionized on the spot, excited in a little beaker glass full of nitrate of silver (extemporaneously sheltered by placing it in a small plate box) in the place of the ground glass or film at *g*, having beforehand covered the lens by a cap at the tube of *e*, placed between it and the negative. Remove the cap for a few seconds, and develop on the spot; wash and fix, and dry as usual. All was done with ease, despatch, and success, notwithstanding the presence of a dozen gas lights in the room. The microscope arrangement was placed on a table, of course at the height of the negative, which, we have shown, was placed on an ordinary camera stand at about four feet distant. How far we have succeeded in our exposition of Mr. Shadbolt's proceedure it is not for us to say. We have at least had a good intention in making the attempt. In next we shall describe more minutely Mr. Jackson's method by which daylight is emplo and by which the focussing screen is dispe with.

In allusion to our "Amateurs' Column," would say that, so little is known respecting manufacture of paper required for photogra purposes, that we have chosen to occupy a space in this Journal, from time to time, such details as we were in possession of rela to the manufacture of paper for photogra purposes, trusting that the "amateur" w take some interest in acquiring such informa as we had to offer. In return for our labou and we may honestly say that much trouble time have been expended in collecting the in mation, to say nothing of its cost—we have the great satisfaction of hearing from whispering little monitor, the all-but fabu "eaves dropping bird," that our exertions been likened to those of a man who undert to tell you how a coat is made, but will insist on treating you to a disquisition on growth of wool! Now let such critics lo little closer. Our column is headed "Amat column" for what? By what right do assume to assign us our task? The hea is general, and allows us to proceed acc ing to our means and convenience. Will pretend that we have given informa with which amateurs generally are wel quainted? And is it not of the first imp ance, method apart, that the amateur sh understand all that is known with certa respecting that material without which cannot proceed one step *satisfactorily*? we are almost ashamed to have to offer defence of our mode of proceeding; bes we know too well the moral of the fable of man who tried to please everybody," t exceedingly sensitive as to any criticism w ever, always excepting friendly admonitior advice. We shall, in our next, fulfil our pro of recording the method by which the print the "Pencil of Nature" were produced. P some of which have remained unchanged period of nearly fourteen years.

It will be seen, on referring to the rep the meeting of the London Society, on th instant, the sum of £50 was voted fro funds, for the Archer Testimonial, with dissentient voice. This is in accordance the opinion we expressed in our last nu and we congratulate the members upon unanimity.

Liverpool Photographic Society.—The next meeting of this Society will be hel Tuesday Evening, the 17th instant, at the I Institution, Colquitt Street. Mr. Keith will a paper on "Photographic Rooms;" and Glover will also read a paper on "The S Bath."

ANCHESTER PHOTOGRAPHIC SOCIETY.

: annual meeting of the above Society was l on Tuesday evening, November 3rd, 1857, he rooms of the Literary and Philosophical ;ety, George Street; Professor Williamson in chair. There was a numerous attendance.

he Honorary Secretary (Mr. S. Cottam) ounced several contributions of pictures, and nks were awarded to the donors. Amongst n were some of Macpherson's, from Mr. gins; five calotype pictures, from Mr. ies, of Warrington; and two prints from odion negatives, by the Secretary.

he statement of accounts, which extended · a period of two years (the accounts not ing been made up in time for the last ual meeting), showed a balance in hand of 16s. 6d. at the end of the year 1855-56, a balance of £6 16s. 6d. due to the treasurer he close of the last financial year. The ounts having been passed, the Secretary l the

ANNUAL REPORT.

ıe members of the Manchester Photographic ety will have the satisfaction of knowing, on ısal of this second annual report of the Commit- that the position of the Society is one on which Committee have cause to congratulate them, ough its financial situation is not perhaps so factory, as, but for a cause to be herein explained, ight have been.

ıe Society has first to acknowledge gratefully liberality of the council of the Literary and osophical Society, which has enabled them to ve the more than usually large attendance of bers, with much more comfort than heretofore. ıey have here to record their satisfaction with nanner in which the editor of the *Liverpool and chester Photographic Journal* has placed his mns at their disposal; the change which took : in the proprietorship and management of that nal appeared to afford a favourable opportunity ecuring a prompt and efficient record of the ety's transactions, and the Committee are glad nd that the change has worked so much in rdance with their anticipations.

ıe following papers have been read at the ety's meetings: "On the Albumen Process," by Cash; "Visits to the Society's Exhibitions," by Rev. W. J. Read; "On the Collodion Process," by M'Lachlan; "On the Collodio-Albumen Process," Mr. Sidebotham, who has also communicated : facts as to Photography, naturally coloured, a paper on "A New Dry Collodion Process." ral individuals have achieved much success in last, but from some yet unexplained cause, the ts they have obtained have not been reached ther operators. The whole of these papers have ed great interest, and as the Society now con- principally of practical photographers, much fit may be expected from the operation of the : therein contained.

ımber two of the Society's Illustrations has also published during the past year. The Com- :e have to thank the member who undertook printing, for his voluntary services. The Com- :e for the ensuing year will have to take the ;et into their early consideration, as the matter inting is one which occupies much time and ıtion.

ıring the past year, the Society, instead of ng what might reasonably have been expected ve proved a profitable exhibition of their own, led to the wishes of the Directors of the Me- ics' Institution, and arranged to combine their exhibition with that of the Institution. Their principal reason for so doing was to benefit the Institution, by giving them a novel and attractive addition, and also to obtain a more public and general exposure of the works admitted, than a special exhibition might have obtained; in these respects, success was obtained, but at a cost to the Society of £55 13s. 4d., as the Directors of the Mechanics' Institution only partially contributed to the expenses; and in the matter of catalogue, which had also nearly proved a loss to the Society, the Institution left it entirely to your Committee, who are admitted to have produced the best photographic catalogue that has yet appeared. With these exceptions, it was in itself eminently successful; as even in point of numbers, had many of the pictures in frames been accounted for individually, instead of collectively, it would far have outnumbered any exhibition that has as yet taken place. Your Committee would hope that something may yet be done towards reimbursing some portion of the loss to the Society.

As regards the general progress of the art to which the Society is devoted, that is pretty well known to members generally. Photo-lithography and Photo-galvanography have perhaps the first claims to attention—numerous new applications have been made—numerous new formulæ have been propounded—among these, dry processes stand pre-eminent, and it is to be hoped that whatever processes members may have in hand, that they will frankly and freely contribute, according to the means and measure of their success, to the common fund of information. It may be suggested to the Committee for the ensuing year, as an eligible field for employment, to adopt some method of ascertaining the comparative merits of the different modes of manipulation in use, with a view to the obtaining certainty in their results.

It might have been expected that photography would have received a great stimulus from the Great Exhibition of the year, that of Art Treasures at Old Trafford, it is but too painfully evident that such is not the result of the sanguine hopes entertained; the offers of assistance by this Society were not regarded—the contributions of members were neglected, pictures have been admitted which would not have passed the scrutiny of your Committee; and it would appear from the various critiques which have appeared in the journals specially devoted to the heliographic art, that a tolerably universal opinion obtains that this part of the scheme has been almost a failure. The Committee, upon mature consideration, find that concurrence in the views so generally entertained is the only course open to them.

Your Committee, in conclusion, hope that each member will not fail to evince a lively interest in the Society, either by suggestions to their successors, or by contributions of pictures to the Society's portfolio, or the communication of facts, either of novelty or usefulness, which may come under their notice.

The CHAIRMAN said it must strike those present as a most satisfactory thing, and an evidence of the extraordinary vigour and healthiness of the Society, that, notwithstanding the heavy and unexpected drain upon their funds, resulting from their exhibition in connection with the Mechanics' Institution, they were enabled to close the year's operations with so small a deficit. The item of expense to which he referred was altogether an exceptional one and they might fairly consider that they were in a most gratifying position.

In answer to Mr. W. Fairbairn, who wished to know how their loss at the Mechanics' Institu-

tion Exhibition was occasioned, it was explained by the Secretary and others, that there had been an understanding that the Mechanics' Institution should bear the whole expense of the photographic exhibition, whereas the institution only defrayed part thereof.

Mr. JOSEPH SIDEBOTHAM added that the Society had cause to think that they had not been very well used in the matter, and a similar opinion was expressed by Mr. Fairbairn.

The CHAIRMAN said that the Mechanics' Institution, like the Art Treasures Exhibition, did not appear to have been sufficiently alive to the importance of photography as a process of art. The Society were in the position of men inaugurating a new order of things, and had to encounter an immense amount of prejudice in artistic circles. He was glad to see, however, that this prejudice was gradually wearing away.

Mr. FAIRBAIRN said he supposed he must conclude, from what had been stated by the chairman, that the Society's contributions to the Art Treasures Exhibition had not been properly appreciated.

The SECRETARY replied that the whole of the pictures forwarded to London by himself were returned, apparently unopened, by Mr. Delamotte, the authorized head of the photographic department in the Old Trafford Exhibition.

On the motion of Mr. DORRINGTON, seconded by Mr. FAIRBAIRN, the report was unanimously received.

The following were appointed as officers for the ensuing year:—

President:
The Lord Bishop of Manchester.

Vice-Presidents:

W. Fairbairn, Esq., F.R.S.	W. C. Williamson, F.R.S.
J. P. Joule, L.L.D., F.R.S.	Joseph Sidebotham, Esq.
H. E. Roscoe, Esq., B.A.	Rev. W. J. Read, F.R.A.S.

Council:

The President.	The Vice-Presidents.
Mr. Alfred Barton,	Rev. T. W. Morris,
Mr. J. Compton, Jun.	Mr. E. Mann,
Mr. J. Dale,	Mr. W. T. Mabley,
Mr. J. B. Dancer, F.R.A.S.	Mr. James Mudd,
Mr. J. Dorrington,	Mr. Arthur Neild,
Mr. G. Higgins,	Mr. T. H. Nevill.
Mr. J. W. Long, F.R.A.S.	Mr. John Parry,
Mr. G. T. Lund,	Mr. J. J. Pyne,

Treasurer:—Mr. Edwyn Offer,
Honorary Secretary:—Mr. Samuel Cottam.

The thanks of the meeting were then voted to the officers for the past year for their services.

Mr. SIDEBOTHAM exhibited four very beautiful prints from negatives, taken from etchings by Mr. Nasmyth, which they very closely resembled in every respect. He also exhibited some specimens of his backed collodion process.

Mr. HIGGINS asked if any one knew an antidote to the effects of cyanide, some of which got into a cut in his hand a few weeks ago, and he had been suffering from it ever since.

The CHAIRMAN said that a concentrated solution of iodide of potassium would remove the stains of nitrate of silver.

A conversation then ensued upon the adaptation of photography to microscopic illustrations.

Mr. PARRY said he had paid some attention to this branch of the art, and he found that the gas supplied by the town was not so good this year as last, for everything else being equal, l pictures were not so good now as they us to be.

The CHAIRMAN asked why solar light cou not be used.

Mr. PARRY said he had now waited for a fo night in the hope of being able to take a mic scopic picture by solar light, at noon, and had not been able to take one.

A discussion of a conversational charac ensued as to the relative value of various pho graphic processes, &c., and, on the motion Mr. SIDEBOTHAM, small committees were a pointed to experiment on the baked collodi collodio-albumen, oxymel, and gelatine process and to make reports, accompanied by specime to the Society, in order, by a comparison results, to arrive at some definite information a useful nature.

By the kindness of Messrs. Agnew, a numl of Egyptian photographs, by Mr. Frith, w handed round. They comprised scenes of t highest historic and topographic interest. T views were admirably chosen, both as to local and effect, and the stay-at-home traveller w derive much assistance from them. There a large set, nineteen inches by fifteen inch and a small set, consisting of one hundr price three shillings each, size, nine inches seven inches. The photographs are particula sharp and clear, figures are well introduced, a the tone is very agreeable. It is difficult specify where all are so good, but we w highly pleased with the large pictures of temple known as the "Memnonium," "Theb "The Ruins of Karnac," "The Temple of Phi (Pharoah's Bed), and the Statues of Memnor

A vote of thanks to the Chairman termina the proceedings.

LONDON PHOTOGRAPHIC SOCIET

THE first monthly meeting of this Society, f the session 1857-58, was held on Thursday, e 5th instant, at the Society's Rooms, No , Coventry Street, Leicester Square; the Pr dent, Sir Frederick Pollock, in the chair.

The PRESIDENT congratulated the mem rs and their friends upon the success which d attended their efforts to obtain premises su d to the wants of the Society. He thougl it was a just cause of pride that, unaided by s e resources, it had achieved so much. The prog ss of the Society, as a scientific body, had n unexampled; and there could be no doul of their continued success, for all classes of ie community were interested in their proceed gs and productions. The present rooms cou e relinquished in three, seven, fourteen, or tw y-one years' time, should it be found necessa to provide more spacious accommodation; ut those from whom they held the rooms ha no such discretionary power. They could, t e-fore, at once proceed with confidence to c ry out all the objects of the Society.

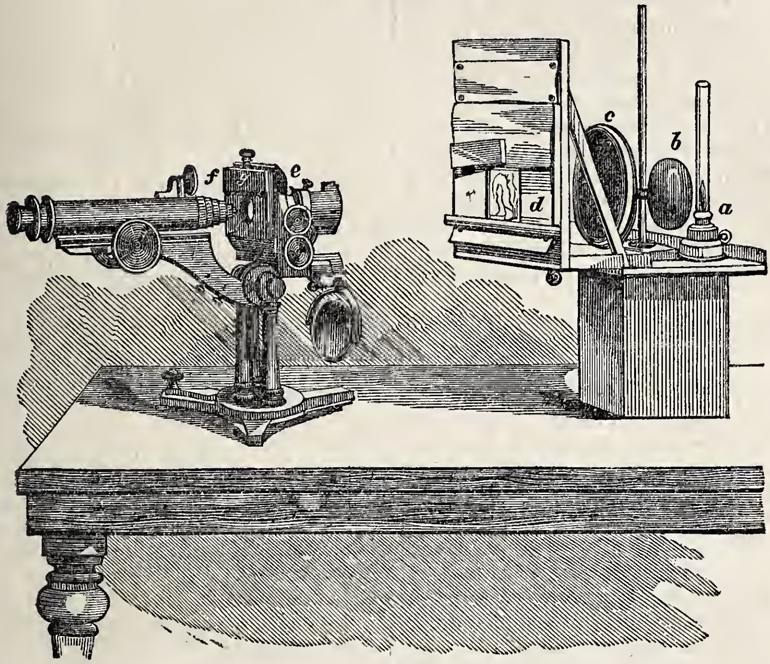
Mr. G. SHADBOLT, President of the M o-scopic Society, read a paper "*On the Mo of Producing Extremely Minute Photographs for Microscopic Examination.*"

He said: — During the winters of 53-54, I was engaged in prosecuting experin nts

tive to the peculiarities of various samples of odion, and amongst other tests I subjected the s to inspection under the microscope. I then ɜrved that some kinds were not only entirely from reticulations, but that the particles ɔdide of silver were so minute as to require siderable optical power to resolve them. At point the idea occurred to me of ascertaining relative capabilities of each sample of odion in regard to its power of recording, orially, minutiæ of detail.

; was accordingly resolved that photographs should be produced of as small a size as possible, so as to bear inspection under the lower powers of a good compound achromatic microscope; and as all things were arranged by the commencement of March, 1854, the first pictures were then produced and exhibited to some friends, at the house of Mr. Rosling. These pictures were also exhibited to the Society in the April ensuing, as was recorded in the Society's journal at that period.

The following diagram illustrates the general disposition of the various pieces of apparatus.



An explanation of the arrangement and mode of operation is given at page 242.

ince then a demand for these minute pictures arisen, and they are now a regular article of ıufacture for microscopic examination.

'he principle acted upon was well known; it his:—that a ray of light refracted by any lium *traverses the same path* whichever end of said path be made the starting point. Take an illustration the case of ordinary photophic portraiture. The *sitter* being placed in *anterior focus* of the lens, the *plate* is arranged s to coincide with the posterior focus of the e lens, which latter focus is situated within ıuch shorter distance from the lens than he anterior focus. These two foci are ned the *conjugate foci*; and if the sitter e placed in the short focus, an enlarged pic- would be produced upon a plate located in place previously occupied by the sitter.

uch an arrangement is adopted whenever object is placed under the microscope for mination, a picture on an enlarged scale ıg formed at a comparatively long distance ı the object glass, and *which picture* is still her magnified by the eye-piece. It is from se considerations manifest that if an illumied negative photograph be made to occupy ordinary position of the microscopic *picture e eye-piece*, a greatly reduced image of the e ought to be formed in the anterior focus of object-glass; and this is found to occur n the trial is properly made.

There are, however, some difficulties to encounter.—*Firstly*, it is difficult to ascertain the focus in a case where the five-hundreth part of an inch nearer to or further from the lens is a matter of moment in placing the sensitive plate.—*Secondly*, the lenses of microscopic object glasses, though as visually correct as possible, have not the visual and chemical foci coincident, a corresponding allowance having to be made when they are used photographically.—*Thirdly*, it is necessary to make several trials to ascertain the correct exposure for any given negative—a point of some difficulty, simple as it appears, *until* the correct allowance for the actinic focus has been determined. A good microscopic object-glass is *always over-corrected* as regards colour, that is to say, the blue rays are projected beyond the red. And let it not be forgotten that the most perfectly constructed lens is a thing in which opposite errors are so opposed as to leave only a minimum of aberration: we cannot have perfection.—*Lastly*, if artificial light be employed for the purpose of illumination, it is necessary that the rays shall fall upon the negative, either parallel or slightly converging, in order that the source of light may be at least as large as the *negative* in appearance. Thus an equality of photogenic action is secured.

The apparatus was arranged as follows, viz.: Having removed the upper stage-plate of a

large compound microscope, I replace it with one of wood, supplied with guide-pins of silver wire, in order to admit of its supporting a slip of glass coated with collodion and excited in the nitrate of silver bath in the usual way. If the ordinary brass stage-plate were left undisturbed, it is obvious that it, and the excited slip of glass, would be mutually destructive.

The microscope is now to be placed in a horizontal position, the objective, intended to produce the picture, made to occupy the place usually filled by the achromatic condenser on the *sub-stage* of the microscope, while *another* objective is screwed into the lower end of the body of the instrument, which is used, not only to focus with, but also to make the requisite allowance for actinic variation.

The negative intended to be reduced is then arranged vertically, with its centre in the axis of the microscopic body, at a distance of from two to four feet from the lower object-glass, and with a convenient screen of card, wood, or thick paper, to cut off any extraneous light that would otherwise pass beyond the limits of the picture.

A small camphine lamp is employed for the purpose of illuminating the negative, having a good bull's-eye lens as a condenser, so arranged with its flat side next the lamp, that the refracted rays shall just fill the whole of a double convex lens of about six inches in diameter, the latter being placed in such a position as to refract the rays of light in a parallel direction upon the negative.

By this arrangement the *bull's-eye* lens of about $2\frac{1}{2}$ inches in diameter *appears* as the source of light, instead of the small flame of the lamp.

By using a bat's-wing gas-burner of a good size, a single lens, instead of the two, may be so placed as to give the necessary uniformity of illumination.

When first I made the attempt to produce these pictures, I focussed *upon the excited collodion itself*, in order that no error might arise from any variation in the planes of the focussing screen and sensitive medium; and to effect this, a piece of deep yellow-coloured glass was interposed between the lamp and the bull's-eye lens, which was removed for the requisite interval after focussing, to allow the action of the light to take effect; but subsequently I found that it was possible to focus upon a slip of collodionized glass that had been excited, washed and dried, without removing the iodide of silver, and then replacing it by the slip intended to receive the impression.

The manipulation is thus performed, viz., the focussing glass being placed on the wooden stage with the collodion *from* the observer, the body of the microscope is accurately adjusted so as to focus distinctly the film of collodion as seen through the slip of glass. When the exact point is determined, the fine adjustment is turned, so as to focus the objective beyond the film, *just so far as the actinic focus of the lens to be employed for producing the picture, differs from its visual one;* the last-named lens is then to be carefully adjusted, so that the image of the negative becomes distinctly and sharply defined when viewed through the microscope; and when so seen, the *actinic image* will fall in the exact plane in which the film collodion is located. The light is then to shut off, a sensitive film placed instead of t dried one, an exposure of from ten to si seconds allowed, and when removed from t stage, the picture is to be developed in the us way by means of a few drops of the ordin pyrogallic acid solution. The picture quic appears as a small dark spot on the glass. is to be fixed and washed as is usual with lar pictures, and set aside to dry in a place p tected from dust, which last-named substa is perhaps the greatest enemy one has to c tend with.

With regard to the allowance necessary to made between the visual and actinic foci, th are various methods by which this may accomplished; but in my opinion by far t best is that afforded by the *fine adjustment* of t microscope itself. In an over-corrected objecti the actinic focus being *more* distant from t lens than the visual one, it is evident tha greater separation between it and the plate required than for accurate definition by sig but as the amount of variation probably diff for every individual lens, though nominally the same power, the exact allowance can o be determined by trial; for a two-thirds of inch that I generally use with the negati about four feet from the lens, the correction quired is an elongation of the focus by $\frac{1}{200}$th an inch; while $1\frac{1}{2}$ inch objective of simi make requires an allowance of $\frac{1}{50}$th of an inc

The proper correction may also be made withdrawing the negative further from the l after focussing. I may also observe that I ha noticed a curious fact with reference to t allowance for variation in an over-correct lens, viz., that the amount of it is not t same for day-light as for artificial light. T merits further investigation.

It may also be desirable to describe t developing solution:—Two grains of pyro-ga acid to one of citric acid, and one ounce water, is better for this purpose than an ac acid mixture, the resulting picture being o more agreeable tone. The micro-photograp when finished, may be mounted by cement over the collodion a disc of very thin glass, means of Canada balsam.

Mr. G. JACKSON, member of the Microsco Society, also read a paper on the same subj entitled, "*A Supplement to Mr. Shadbolt's Pap* &c.

He stated that his first attempt at tak minute photographs was made more t a year after Mr. Shadbolt had described, vately, his mode of operating; and it be his wish to work by day-light, he commen with a small camera, made for the purpose, lent him by Mr. Thomas Ross. Mr. Jacks description proceeds as follows:—

This camera was furnished with the us glass for focussing, which, though gro tolerably fine, was far too coarse for anyth like the precision necessary in a picture t submitted to the microscope. I was there induced to construct a camera which w allow the use of a method of focussing that I found advantageous in taking portraits of

ordinary size. The body of this little instrument is a piece of drawn brass tube, about an inch in diameter, into the end of which another tube is screwed. The tube to which the object-glass is attached slides into this inner tube, and is fastened by a pushing-screw; the sliding motion giving a rough focal adjustment, and the screw on the intermediate tube a fine one.

The plate-holder has a short tube attached to it, which slips with moderate tightness over that which constitutes the body.

When the plate-holder is removed, a brass plate is laid across the end of the body, having a tube screwed into it so as to admit of adjustment. In this tube is placed a small positive eye-piece, equal to a lens of half an inch focal length, which, for these minute pictures, might be much more powerful.

It is evident that this eye-piece constitutes, with the object-glass, a small telescope, in which the image is seen without the intervention of a ground glass or other medium; and, when once accurately adjusted, the operation of focussing is a very simple one.

The original adjustment is made in this way. The distance at which an object is clearly seen when the object-glass is applied to the microscope, is carefully measured, and it is placed in the camera at the same distance from the sensitive surface. A picture is then taken, and most probably found to be very indistinct; but, by a few trials, making use of the screw adjustment, the true focal distance is at last found; and the eye-piece being adjusted by means of its screw-tube, the camera can be focussed by it again at any time, even if the negative be placed at a different distance. This method has the further advantage, that no allowance is required for the difference between the visual and actinic foci; or rather, the allowance is necessarily included in the adjustment. I use a board four feet long, which can be hung in a perpendicular direction. At the upper end of it is a simple apparatus for holding the negative, and the camera is fixed at the lower end. The light is thus taken direct from the sky; and the time of exposure varies with the weather, the density of the negative, the aperture of the lens, and the collodion.

Most of my pictures were taken with an inch-and-a-half microscopic object-glass, made by Smith and Beck; but I have lately tried one of Ross's old inch object-glasses, a single triplet of moderate aperture, and find it to answer very well. The time of exposure with this lens ranges from fifteen to sixty seconds.

A great proportion of my clearest and best-toned pictures have been spoiled by the film cracking into irregular hexagons, apparently the effect of contraction, giving the appearance of a net thrown over the figure. This is a difficulty that I have not yet discovered the means of overcoming; but the tendency to it may be lessened by diminishing the proportion of alcohol, and by allowing the plate to get nearly dry before plunging it into the silver bath. These remedies, however, produce another defect almost as bad as the original; for they appear to prevent the even penetration of the film by the bath, and the result is a greyish picture covered with white spots. Any suggestion on this subject will be thankfully received.

The developer that I employ is that recommended by Mr. Shadbolt; but I have latterly used it in a peculiar manner.

On one occasion I forgot to draw out the slider of the plate-holder, and only discovered it by the fact of being unable to develop anything on the glass. As an experiment I replaced it in the camera and exposed it the usual time, when I was agreeably surprised to find a clear and well-toned picture.

Since that time I have generally poured the developer on the plate immediately after taking it from the silver bath; and after moving it to and fro two or three times, have poured it off, and placed the plate in the camera as quickly as possible. On exposing it the proper time the picture is found to be fully developed, and must be immediately washed and fixed in the usual manner. Should it, however, be too faint, the washing may be delayed until it is sufficiently darkened; but it is not generally so clear as when the exact time of exposure has been hit. I have often tried comparative experiments, and I have constantly found that this method not only saves time, but gives the clearest pictures.

Mr. Shadbolt and Mr. G. Jackson demonstrated personally the peculiarities of their respective arrangements and modes of manipulation.

Mr. W. Jackson, of Lancaster, sent a paper "*On the production of direct transparent collodion positives.*"

Mr. Jackson stated that his attention having been called to the fact that no process with the above object in view had been published, sent an account of some experiments made by him, two or three years ago, with the ordinary negative collodion process, which, by slight modifications, yielded pictures which were positive by transmitted light. One method was to follow the ordinary process with the pyrogallic developer, but as soon as a slight development took place, the plate was well washed with water, and then re-immersed for three or four minutes in the silver bath. This plate, on being again treated with the developer, gave positive shades, while the lights, which seemed unaltered, became transparent. Another and more ready method was to allow diffused daylight to fall on the plates as soon as the image began to appear, and after pouring on the developer. The effect is not produced if the picture be too much developed. An amber-coloured collodion is best, and used with ordinary nitrate of silver. Fused nitrate and colourless collodion give exaggerated high lights. Thin collodion is more sensitive than a thicker one, but does not give such deep shades. The strength of the nitrate bath was varied from ten to fifty grains per ounce; the weak solutions being most manageable, but not giving such deep shades as the stronger ones. Twenty grains per ounce, with four drops of glacial acetic acid, gave good results. The pictures may be improved by washing off the developer, dipping the plate in a three-grain solution of silver, and then applying the developer again. This must be done before the picture is fixed. Some practice is necessary to hit the right point of

development previous to the reversing operation; and skies come out too strongly, unless shaded off during part of the exposure; moreover, the parts of the picture bordering on the skies often become negative.

He regarded these pictures as being curious, rather than useful. The definition was good, and the plates were more sensitive than ordinary. In a postcript he further stated, that the amount of free iodine in the collodion modified the colour of the shades. He also added that the pictures could be produced in one-fourth of the time required for ordinary collodion positives. The most effective pictures were obtained when the exposure was such that the first faint development occurred soon after the application of the pyrogallic acid solution, which was not stronger than from one-half to three-quarters of a grain per ounce. The method, by exposure to light, is to be preferred; but, if the other plans are tried, the acetic acid must be omitted from the bath, and a stronger image be developed upon the first exposure. To deepen the shade, it will be best to repeat the development before fixing —a solution of nitrate of silver of twenty grains per ounce may, in this case, be used. The cyanide, for fixing, should be of the strength of from six to seven grains per ounce of water.

Mr. Malone, upon comment being invited, observed that, some four years ago, he had, by following the ordinary collodion process, obtained, to his surprise, a very good transparent positive picture, when he expected to have produced a negative. The result happened thus:—he exposed a plate in the camera to the image of a strongly-illuminated white plaster bust, for a much longer time than usual. He then developed, with pyrogallic acid, in the usual way, and fixed with hyposulphite of soda. The image, although a good one, did not seem to him, at that time, to be of practical interest. He, therefore, allowed the fact to remain without further investigation. It seemed extraordinary that light should, in excess, take away from the impressed plate the power of precipitating silver from the liquid upon its surface; and, at present, no thorough explanation is offered to the rationale of the process. The formation of a deposit in the shades of the picture, he thought, might be accounted for by the length of the exposure being such, that the shadows which ordinarily do not affect the plate, at length, throw light for a sufficient length of time to impress parts which, by a shorter exposure, would remain in a normal condition. But, by what strange action does the light destroy its original work?

Mr. Fenton had met with similar results, but could not command the phenomenon with certainty. He thought the matter of greater importance than was generally supposed; he trusted Mr. Jackson would continue his experiments.

Mr. Crookes had repeated Mr. Jackson's experiments, and from the one which gives the result without subsequent exposure to light, he concluded that the action was not to be accounted for by a reference to the destructive action of light alone.

Mr. Malone endeavoured to reconcile the two cases by reference to what he had observed in the process of "sunning" iodized paper. He had prepared in the usual way, and in the dark, a sheet of Mr. Talbot's iodized paper; upon this he placed a strip of black paper, and so managed as to cover up half of the iodized paper and strip, the other half with strips interposed was exposed to sunshine for twenty minutes; then the other half was momentarily exposed to the light; next, the whole was treated with gallo-nitrate of silver. A *black positive* image of the strip appeared on the half that had been sunned, while a *light negative* image or the other half of the strip was developed on the half of the sheet momentarily exposed: the result was very instructive and at first sight perplexing. It would seem that the paper *not sunned* is capable of throwing down silver spontaneously from the developer by ordinary chemical action, while the same paper sunned loses this power, unless the action of light be limited, in which case it appears to exact the ordinary chemical affinity of the paper for the silver of the developer. The subject is a very curious one and still obscure.

A Member, whose name we were not fortunate enough to obtain, stated that he had obtained a direct positive by first exposing the plate entirely to light, and then exposing it to an image in the camera, developing as usual. This is in accordance with Mr. Malone's experience; the exposure to light at first might be carried just to the verge of the destructive action, then the increase of light, from the luminous parts of the camera image, would bring on the destruction of the affinity for the silver in the developer, and a positive must result.

Mr. Shadbolt also took part in the discussion, and thought the destructive action of light was further evinced by these experiments.

The thanks of the Society were given to the authors of these communications.

Some good specimens of collodion positives were sent to the Society from a professional photographer in Australia, with a view of showing the present condition of the art in that distant colony. The process by which they were obtained was not communicated. The donor requested that some notice might be taken of them in the Society's *Journal*. The matter was referred to the council to deal with as they might think best. There was a slight disinclination on the part of some members to give special prominence to these specimens, since they were not superior to some of those produced in London and Liverpool. The donor would enhance his gift if he would give the exact details of his process.

At the conclusion of the ordinary business of the evening, the meeting was rendered a special one to consider the proposal of voting £50 from the Society's funds for the purposes of the Archer Testimonial. On the motion of Sir Wm. Newton, seconded by Mr. Vernon Heath, the proposition was carried without a dissentient voice.

Some interesting photographs by Mr. Howlett were exhibited during the evening.

At the conclusion the President announced that the Secretary had kindly provide tea and coffee for their refreshment, and especially for those who had taken part in *the discussions.*

MANUFACTURE OF GUN COTTON.

In an American publication, called "The Ambrotype,"* by Charles A. Seely, A.M., the author gives the following recipe for the manufacture of gun cotton:—

"If you have courage, and the ambition to manufacture for yourself, follow the annexed conditions exactly, and you will succeed—otherwise a miserable failure. Take

Sulphuric acid sp. gr. 1.85, 9 oz.
Nitric " " 1.42, 8 "

"Make the mixture in a porcelain bowl or mortar. If the acids were both warm, the temperature of the mixture will be about 150°. The acids, at all events, must be used at that temperature. If necessary, heat or cool the mixture till you reach that degree. Then, in small quantities at a time, and rapidly, immerse or stir in one oz. cotton, well pulled out. Do the stirring with a glass rod. Keep the mass in constant motion with the rod, by punching or stirring, for ten minutes. (All this must be done under a flue, or in a current of air.) Now pour off the excess of fluid, and plunge the cotton into a large quantity of water—stir it about—put it in fresh water—continue washing till all traces of acid are gone. Finally, wring out the water from the cotton in a towel. If you are in a hurry to get it dry, displace the water by soaking in alcohol. Wring again, pull apart, and spread out to dry in a warm place.

"During the soaking in the acids it frequently happens that bubbles of an orange-coloured gas will rise from the mass. These must be instantly checked by punching or stirring vigorously the part where they appear. If not so checked, your cotton will soon be off in smoke, which fiery smoke, if you breathe, will insure you a speedy passage to the spirit land.

"If you have performed the whole operation properly, you have a gun cotton of the following properties:—It looks like common cotton. It feels harsher than common cotton. When pulled apart it makes a sound like tearing cloth. When set on fire it burns explosively, leaving a very small quantity of black ashes. When put into the ether and alcohol mixture it immediately sinks to the bottom, and soon dissolves by shaking, emitting small bubbles of air.

The author recommends the use of the best materials it is possible to get—especially the cotton. In speaking of the gun cotton imported into America by the French, he strongly condemns it as worthless—stuff with a fair name but foul properties.

DIRECT POSITIVES ON COLLODION.

By F. Hardwich, Esq.

As we intend shortly to treat on the positive process on glass, we wish our readers to peruse beforehand, the fundamental papers on this subject, by Mr. Hardwich. The following was read before the London Photographic Society, in 1854, at which time we gave a brief notice of it; but, the circumstance above-named, induces us now to publish it *in extenso*.

I.—*Condition of the film most favourable for the production of pictures to be viewed by reflected light.*

"My own attention was first directed to the positive process, quite, as I may say, accidentally; it was at a time when I was comparatively ignorant of the effects which would be produced by varying the proportions of the ingredients in the sensitive collodion, and having adopted Archer's method of iodizing, viz.: by adding a certain quantity of a saturated alcoholic solution of double iodides of potassium and silver, I failed, from the alcohol I employed being in too concentrated a state. I had previously rectified it from carbonate of potash, and its solvent power being thus diminished, the amount of iodides taken up was not sufficient for the purpose; when I say 'I failed,' I mean it in the sense that I was not able to obtain good negative pictures, which was the object I had then in view; they were all sadly wanting in 'intensity,' and I found it impossible to 'print' from them with anything like success. However, I soon began to notice that these pale, unsatisfactory negative pictures looked exceedingly well when viewed as positives by reflected light; there was a nice gradation of tone about them which pleased me, and I adopted the plan of backing up with black varnish, and preserving them in that form.

"Now at this time, as I said before, I was not aware that I was employing a collodion with an unusually small proportion of iodide; but if I had been, I should not have referred my success in producing positives to that cause. I had never seen it stated in any work with which I was acquainted, that a difference ought to be made in the two cases. The directions I had received were these: 'If you wish to obtain a positive, expose in the camera for half the usual time, and develop with sulphate of iron, to get a bright deposit of metallic silver.' Now the object I have in view, in laying my paper before the Society this evening, is to prove that such directions as these are altogether insufficient, and that, if we wish to obtain the best results, we must use, not only a different developing fluid, but also a different collodion and a different nitrate bath, in the case of negative and positive pictures respectively. It may be asked, 'What is the inferiority of which you complain in the positives produced by collodion, as it is ordinarily sold?' I answer, it is this: 'That the whole of the picture is not to be seen at once upon the surface of the glass.' Suppose you are taking a portrait, which I think will readily be allowed to be one of the most severe tests of a collodion that can easily be applied, it will be found that the *high lights*, such as the forehead, the hand, and especially the shirt of the sitter, come out with exceeding rapidity, and in a degree out of all proportion to the time taken by the shadows and half tints to impress themselves; the consequence of this is, that stop the action of the light when you will, you do not obtain a perfect picture; after backing up with the black varnish it will be seen either that these high lights above alluded to, are good, and the rest of the figure almost invisible; or, on the other hand, that the coat, dress, &c., are very clear, whilst the face and hands present an unvaried white and flat surface without any detail or distinction of parts. These peculiarities, as I said

* Ambrotype means positive collodion pictures, like Keith's.

before, do not depend upon the time of exposure, nor, I may add, in any way on the developing fluid, but simply on the fact that the collodion employed, is not capable of giving such a film of iodide of silver as is adapted to produce impressions visible by reflected light.

"Having thus stated the principal difficulties which we have, ordinarily speaking, to encounter. I proceed to show how they may be overcome, and what is the best sensitive mixture for that purpose. In making my experiments, I first prepared simple collodion by dissolving soluble cotton, four grains, in five drachms of æther and three of highly rectified alcohol; these are the proportions recommended by Mr. Hadow, and I believe them to be the best that can be used; they do not, however, of course apply to commercial æther, which already contains a considerable quantity of alcohol. In order to iodize my collodion, I employed iodide of ammonium (purified with care) in four different proportions, viz., four grains to the ounce, two grains, one and a half grain, and one grain.

"The films produced by these four mixtures, after dipping the plate in the nitrate bath, were very different in appearance; the lowest of all was pale, of a bluish opalescent tint, so transparent that the letters of a newspaper could be read through it with facility; the second somewhat similar; the third of a greyish hue, but still comparatively transparent; the highest of all, viz. the four-grain, creamy and opaque.

"The photographic properties of the films differed considerably; after comparing numerous results, I was satisfied that the two-grain solution was superior to the four-grain for the purpose I intended it; more of the details of the picture were visible at once on the surface of the glass, and there was less tendency to the overdone, flat appearance before complained of. Between the 'two-grain' collodion, the 'grain and a-half,' and 'the grain,' there was likewise a difference, but not to the same extent; on the whole, I was disposed to give the preference to the 'grain and a-half,' the last of all requiring too long an immersion in the bath to be used with advantage.

"It was not my intention at the time I began these experiments to make any variation in the amount of soluble cotton generally used; I found that four grains to the ounce gave a strong and even film upon the glass, and such being the case, there appeared nothing more to be desired; however, a fact that came under my notice soon afterwards altered my determination; I began to suspect that the weak solutions of nitrate of silver I was employing did not penetrate the film properly, and consequently I wished, if possible, to remove this objection by diminishing its thickness. The result of the change proved even better than I had anticipated, although the solutions were rather more troublesome to manipulate with; I obtained invariably more perfect pictures; the gradation of tints was now decidedly superior to anything I had met with before, and, although I could not immediately explain the reason, I was satisfied that I had gained an advantage.

"The composition, then, of the collodion, which I found after many trials to work the best, is as follows:—Æther, five drachms; alcohol, three drachms; soluble cotton, one and a-half grain; iodide of ammonium, one and a-half grain; instead of this, two grains of each may be used, or even so little as one grain, without very materially affecting the result; but in the latter case the mixture is so fluid that it is apt to run down the neck of the bottle whilst we are attempting to pour it on to the plate. These proportions become very simple when it is considered that they are at once produced by diluting down an ordinary negative collodion rather more than one half, with the proper mixture of alcohol and æther.

"There is one point relating to this subject which I ought not to omit to mention; it is this, that by diminishing the proportion of iodide in the film, and also by diminishing the soluble cotton, you increase the *sensitiveness.* Why is it that these weak films give better half tones than the opaque ones? Because they are more sensitive to *feeble rays* of light! I made many experiments to determine this, and I have no hesitation in stating that such is the fact. Neither is it difficult to conceive why it should be so, because, as it has been remarked, the more dilute the solutions from which iodide or chloride of silver is precipitated the more gradual the precipitation, and the more finely divided will the particles of the precipitate be; hence we can well understand that such being the case, they ought to be more sensitive to light; however, we must not confound 'sensitiveness' with 'intensity.' I would use this latter term to signify that the deposit of metallic silver producing the image is thick, and obstructs the luminous rays of light strongly, so as to show well as a negative; 'intensity,' I imagine, relates in some degree to the *number* of the particles of iodide of silver; in other words, to the thickness of the film; but 'sensitiveness' is independent of this. Now 'intensity' it required for negative pictures, but it is not required for positives, and therefore in such a case I would have as little iodide as possible.

"At the risk of repetition, I will give a short recapitulation of the conclusions which I wish to establish. They are these:—That no proportion of alkaline iodide in collodion beyond that which gives the transparent opalescent film, is adapted to produce a perfect image, visible in every part by reflected light. Allowing that a photographic picture is produced by chemical rays of light acting in various degrees on the several parts of a sensitive surface, it becomes necessary that the particles of iodide composing that surface should be in a peculiar state both as to *number* and as to *fineness of division*, in order that the more intense and the feebler rays should work uniformly together, the tendency being in the former, so to speak, to get ahead and outrun the latter. The author of the paper supposes further, that a diminution in the proportion of iodide assists the action of the feeble rays by producing a more finely divided deposit, and curbs the violence of the more energetic rays by lessening the number of the particles.

II.—*Nitrate Bath and Developing Fluid.*

"I have spoken of the condition of the film of iodide of silver which appeared most favourable to the production of collodion positives; I

ow proceed, with a view to the completion of he subject, to consider the proper strength of he nitrate bath and the developing fluid.

" With regard to the former, that is the nitrate ath, there were two points of interest to be scertained,—1st, whether the salt of silver could e used in an accurately neutral condition, and : so, what were the best proportions; 2nd, he effects of adding nitric acid in graduated uantities.

"Three solutions of nitrate of silver were repared, of different strengths: A, forty grains o one ounce of distilled water ; B, thirty grains ;) twenty grains ; all were carefully neutralized, nd saturated with iodide of silver.

"On immersing a plate coated with a *four rain* iodide collodion in each of these, it was ound that with bath No. C the decomposition f the alkaline salt was imperfect. However, vith the proportion of iodide reduced from four rains to two grains, or one-and-a half grain, he appearance of the film was the same in each ath, showing that even the lowest proportion f nitrate of silver was sufficient for the conver- ion of the whole of the iodide of ammonium nto iodide of silver.

(To be concluded in our next.)

JNIVERSAL FORMULA FOR AMBROTYPE OR POSITIVE COLLODION.

By Charles A. Seely, A.M.

'HE author attributes the success in the manu- icture of this collodion to the excessive care vhich must be observed in procuring and com- ounding the materials as here recommended. ny person following the directions given, and sing the best ingredients, will find no mystery 1 the process, and be sure of obtaining the est results.

'lain Collodion.	Photographic Ether...	6 oz.
	do Alcohol	4 ,,
	Gun Cotton	..60 grs.
:xcitants.	Iodide of———	50 ,,
	Bromide of———	20 ,,

The kind of iodide and bromides may be letermined from the following hints:—

The excitants must dissolve in the plain col- odion without the addition of water, or with a ery small quantity.

The iodides and bromides which dissolve vithout addition of water, are those of

Cadmium,
Zinc,
Magnesium,
Ammonium.

Use any of these alone or in combination, but n the proportion of iodide and bromide as given n the formula.

Iodide of potassium is soluble to a certain xtent, but the bromide is not recommended.

Each excitant, however, has a specific effect, nore or less notable, and each has had its ealous advocate. The difference of effect is hiefly as to the time of maturity of the col- odion. Collodion, newly made, is not so good s after a certain time of keeping. All sensi- ized collodion, when first mixed (provided the ngredients are absolutely pure), is colourless. The changes of colour through which it passes re—straw colour, lemon yellow, golden yellow, range yellow, orange, orange red, red, reddish brown. The rapidity of change depends chiefly on the excitant. Cadmium collodion changes very slowly, requiring years to reach the red colour, whilst ammonium collodion will pass through the same changes in a few days. As a rule, collodion of an orange colour will be found to work the best.

Cadmium collodion is most permanent. If it works well, you may be sure that it will not deteriorate in many months. Therefore, should you wish the long-keeping collodion, use cad- mium.

If you want a collodion that will be fit for use in a few hours, use ammonium or zinc, but do not make much of it, for next week it may be worthless.

Cadmium collodion will generally give a picture of finer detail—ammonium, of greater boldness.

Collodion newly made has not so good flow- ing properties as when it has acquired age.

Great advantage will often be found in mixing the various excitants, provided always the relative quantities of iodide and bromide are maintained.

For example:

Plain collodion	10 oz.
Iodide of cadmium..................	30 grs.
Iodide of zinc........................	20 ,,
Bromide of cadmium...............	10 ,,
Bromide of ammonium......... ..	10 ,,
Plain collodion	10 oz.
Iodide of ammonium	10 grs.
Iodide of potassium	20 ,,
Iodide of cadmium..	20 ,,
Bromide of zinc......................	20 ,,
Plain collodion	10 oz.
Iodide of cadmium.....	50 grs.
Bromide of cadmium................	10 ,,
Bromide of ammonium............	10 ,,
Plain collodion	10 oz.
Iodide of cadmium............... ..	30 grs.
Iodide of potassium	20 ,,
Bromide of cadmium........... ...	20 ,,

The magnesium, zinc, and cadmium excitants, also iodide of ammonium, dissolve without any difficulty, others require to be finely pulverized and vigourously shaken in plain collodion.

The quantity of gun-cotton given in the formula, although generally suitable, will some- times be found too great or too small. The collodion requires to be of such a consistency that it will flow out in a uniform and even film, free from waves. If it is found on trial that the collodion is too thick or too thin, add ether and alcohol, or gun cotton, as is necessary.

Collodion, by keeping, acquires better flowing qualities.

THE DEVELOPER.

Water..........................	20 oz.
Protosulphate of iron	1½ ,,
Acetic acid	3 ,,
Alcohol	1½ ,,

Put the ingredients in the order named above, in a suitable bottle, shaking after each addition. When the mixture is thorough, filter for use.

In developing, the mixture should be poured from a wide mouthed bottle.

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Having given the greater number of the dry collodion processes mentioned in the Journal a fair trial, sometimes succeeding with each and sometimes not, I have come to the conclusion that none are to be depended on, and agree with you that no dry process has yet appeared which can give such results as those produced by wet collodion.

After all that has been written and said on the subject, I do not think the obstacles in the way of working with wet collodion so very great that they cannot be overcome. Cameras and chemicals can now be packed into such small compass that there is no more trouble in carrying the one apparatus than there is in carrying the other. The greatest difficulty which appears to me is that of obtaining a sufficient supply of water, which cannot be done without; but this with a little care might also be overcome; and considering the satisfaction, which I humbly think is sufficient recompense for any extra trouble—of knowing that your picture is safe; that you have got what you wanted without the anxiety and doubt as to whether the picture you hope to have taken will be a good one, or whether it will turn out a picture at all. I have been often disappointed in this way, which is anything but pleasant.

Another drawback attending the dry process is, that prints taken from the plates do not appear sharp. What this is owing to I cannot explain; but they have a woolly appearance, from which those printed from plates taken by wet collodion are entirely free. I should be glad to hear whether you or any of your correspondents have found this to be the case?

Respecting the fading of positives—Is not the circumstance of yours having remained in their original freshness for thirteen years a proof that the method employed by you is at least a good one? Yet you say you do not confide in the old method,—I presume the method by which these pictures were toned and fixed. If time be not a proof of stability, what is?—how shall it ever be known that *any* process will keep a positive from fading? I should have faith in your process, were I sure I could conduct it properly, for even the best methods are unsuccessful in some hands; nevertheless, your process should be made widely known. I have always looked upon water as the chief remover of all deteriorating substances, using plenty of it, pumping on the print, steeping in and changing the water for weeks, if necessary.

I should be glad to know the method of toning by hydrosulphate of ammonia, and should feel obliged by your giving the particulars in your next Journal.—

I am, sir, your obedient servant,

Huntingdon, 7th Nov., 1857. R. S. D.

[Very beautiful results have been obtained by the dry processes, and the advocates for those processes maintain that you can get everything that you require in the way of sharpness and delicacy of detail. We still have to be convinced that it is wise to give up the wet process where it can, by some extra exertions, be used. We have not observed the want of definition you speak of. Perhaps some of our readers may be able to assign a cause for this defect in your specimens? If a picture made by the old process may remain good for thirteen years, it does certainly follow that other pictures made in the same way ought to be as permanent; but then, against this, we have to contend with the fact that the majority of pictures of the same class have hitherto suffered by time and exposure. It may be that none of the present *silver pictures* will permanently resist an impure atmosphere. Those which now stand as exceptions to the rule may have been existing under certain favourable conditions yet to be clearly ascertained. The process in question will be treated of in another part of this impression. That plenty of water for washing the proof is important, cannot be doubted: but it must be borne in mind that excessive washing injures delicate impressions. One fact which is somewhat perplexing is, that some of the old pictures which had *only three changes of water* are still "permanent." We still want a clearer view of the *number* of circumstances which have concurred to destroy the early photographs, and we want to know the exact rationale of the destructive agencies. Our plan for using sulphide of ammonium (hydrosulphate of ammonia) was this: we selected a good strong chloride of silver-copy, which had been rendered purple by being ironed or heated after the usual three changes of water, and this we immersed in a boiling solution of caustic potash; then, after a thorough washing, we exposed the picture to the vapour of the sulphide of ammonium until the required tint was obtained. In an experimental trial we finally immersed the picture in dilute sulphuric acid, followed by washing first in water and then in weak lime water. But we would have it understood that we have no plan which we know to be effectual against all the possible conditions of our atmosphere. We hold that pictures made as above alluded to may still fade, if not protected from sulphuretted and other vapours. The subject is too difficult to be treated in a dogmatic way. We must do what Sir Isaac Newton is recorded to have done when working amidst doubts and difficulties: "*wait* for more light."—Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—Probably you have noticed my advertisement which has been inserted in your Journal several times, but first appeared in the *London Photographic Journal* in June. In May the editor acknowledged a picture of the kind (that I sent him) as a good one, &c.

In August Mr. William Smith, of Tain, sent to me for a specimen, and afterwards for instruction according to advertisement, which was sent, with thanks for his custom. Shortly afterwards a paragraph appeared in the *Inverness Courier*, which went the round of the papers, stating—"Mr. Smith, of Tain, announces a discovery, by which he is enabled to take likenesses on card, paper, leather, &c." I immediately wrote to him, wishing for his explanation. He wrote back, stating "that he did not claim the discovery of the process for taking on cards, &c., but on leather." Now, as the process is applicable to leather and other articles, as we proved in our first experiments, and as may be seen by the nature of the process, we consider his remarks about his discovery on leather, are merely evasive, the process being the same, but more expensive and uncertain.

For your private gratification I enclose a copy of the process, also a small picture taken by it.

I am, yours respectfully,

THOMAS BULLOCK.

[We insert our correspondent's letter, because it relates to a modification of the direct positive process, which may become very useful for a variety of purposes. The process, moreover, has been communicated to us. It is ingenious and simple. We advise our correspondent to allow it to be published. He may be sure it will not be long before it is generally known. Half-guinea "customers" are not all to be depended on; and the original contriver of the method should secure to himself whatever credit he can obtain for his ingenuity. Pictures of a similar character have long since been obtained in France

All that is now required is to bring the manipulation to perfection. The specimen sent us is certainly one of the best we have seen, and it is evident that the process will yield very beautiful results. We would advise that a card should be used instead of paper, unless the paper is to be at once mounted or framed. The transmission by post has injured the border of the picture sent. The film having split off in places.—Ed. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Dear Sir,—I beg to inform Mr. Gulliver, whose letter was inserted in your last number, that if he will take a little more patience, and work out the *first-named* receipt for colouring collodion positives, (as given by you in No. 19, and which appeared in the London Society's journal in February last,) he will find it everything that can be desired; and by following minutely the instructions given, he will be able to produce depth of colour and smoothness of surface unattainable by any other formula.

I am not a lover of *coloured* collodion portraits, for *a really good positive* needs no colouring; and, in my opinion, they do not deserve to be classed amongst photographic productions when colour has once touched them, even if ever so little; but still I have tried many recipes, and I find none better than the above-named; however, I will give Mr. Gulliver's a trial, and let you know the result.

In reference to the letter signed I. F. Bounes, Windermere, in your last, I beg to inform him that Messrs. Bland and Long, 153, Fleet-street, London, have long sold the instruments named by him for selecting the point of sight in taking views.

Yours very respectfully,

Oct. 26, 1857. LILLYWHITE.

[We quite agree with "Lillywhite" that a *good* photograph is injured by any attempt at colouring. Specimens of a less perfect kind are, however, rendered more agreeable by judicious tinting, done by a skilful hand. Ed. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

Amicus.—We have seen our contemporary's "funny" attempt. We used the word "abstracted" deliberately if not "advisedly." We might have used "abridged" or "condensed"—"extracted" would not have suited the case. We did more than *extract* the article in question, we spent time upon it, and we have been assured it has gained by our treatment. We doubted at the moment, and we doubt now as to *abstracted* being in that case good English, but having what our contemporary would call "the prestige of a name" to support us, we let it pass. The present number of the *Philosophical Magazine*, published since our use of the word, has "*abstracted*" in the sense of "condensed." If we recollect rightly, we first learnt the use of the word from this source. It is a convenient term, and, if our contemporary chooses to say so, we allow that the practice implied by the word is convenient also. We never "abstract" anything without acknowledging the fact, and "a fault confessed is half pardoned," at least so the French proverb says!

J. D.—We have seen M. Claudet's photographs taken by Voigtlander's large lens. The portraits are very fine; but then they have been taken at a proper distance from the sitter, otherwise they would justly come under Sir David Brewster's condemnation. A large lens does furnish, as regards a near object, a *hundred different views* of the same thing. Our contemporary must be thinking of a plane surface when he undertakes to demonstrate that Sir D. Brewster is wrong. Let him consider the case again, and he will find it necessary to mention a certain angle which must be attended to when an object having its parts in different planes is to be copied. Most of the large portraits to be seen in the shop windows are, as Sir D. Brewster asserts, exaggerated representations of humanity. As to the microscope not detecting the overlapping, a beginner in *experimental* optics could refute this objection.

Papyrus.—The *dried* feet of oxen and of sheep are now used to make good paper size. The sheep's feet are said to furnish a size different in its properties to that obtained from other materials. We are convinced that paper photography is very much dependant on this question of the sizing. It is asserted that Canson's best paper was sized with a mixture of wax and caustic potash, in the place of ordinary resin or curd soap.

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MR. HARDWICH'S
NEGATIVE COLLODION.

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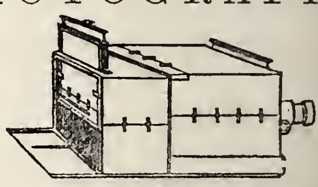

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Printed by the Proprietor, HENRY GREENWOOD, of No. 14, Fairfield Crescent, in the Parish of West Derby, at his (e, 32, Castle Street, Liverpool.—November 15, 1857.

THE LIVERPOOL & MANCHESTER
Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

NEW SERIES.] No. 23.—DECEMBER 1, 1857. [Price 3d. Stamped 4d.

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The Liverpool & Manchester Photographic Journal.

New Series. No. 23.—DECEMBER 1, 1857.

R remarks in this place must to-day be brief, ıce we have more matter in type than we can ert: several topics up on which we had intend to offer some comments must therefore stand er. The proceedings of the Liverpool and orlton Societies will be found to be full of erest. We shall recur to them again. Mr. rnett has favoured us with some remarks on burnt-in porcelain, to which we would call e particular attention of our readers, for it ıst be evident, if they are correct, that one of r contemporaries, and also one of the leading mbers of the Liverpool Photographic Society, ve not acted with that candour which we desire see one practitioner in the art act towards other—whether it has been done intentionally not we will not presume to say, but leave our ders to form an opinion for themselves.

At the meeting of the Photographic Society Scotland, on the 5th ult., Sir David Brewster mmunicated the following new process for y Collodion, discovered by M. Dupuis, Officer Health to the French Army of Occupation at me:—The collodion is formed of eighty cubic ntilitres of ether (s.g. 60), forty ditto of alcohol g. 36), and one gramme each of gun cotton d iodide of zinc. Iodide of ammonium would more rapid, but the blacks not so good. The nsitizing bath is composed of ten grammes sed nitrate of silver, one hundred and fifty ammes distilled water, and fifteen grammes mmercial acetic acid. Afterwards wash in stilled water, and coat with a solution of dexne of the consistency of three degrees of the rup-measurer of chemists. The developing lution is formed of one gramme pyrogallic id, three hundred grammes distilled water, d one gramme crystallized citric acid. Less ric acid might answer, and allow the exposure be shorter. The picture may be strengthened adding nitrate of silver. The exposure in nshine should be from two-and-a-half to three inutes, with a small single lens of $\frac{1}{4}$ plate e; diaphragm, eight millimetres; focus, teen centimetres: if without sunshine, about e minutes exposure will be required.

Some, not very dignified, remarks have been ade by a medical practitioner, with a view to row ridicule on those who fear that the comon or unguarded use of cyanide of potassium ay lead to serious and even fatal accidents. nce this "natural guardian of the public alth" has not condescended to *reason* upon e subject, we have simply to re-assert our mer statement, that this exceedingly poisons salt is capable of producing considerable ischief when it enters the body through an incised wound. But it was not this species of accident which we had in mind when we inserted a description of the remedies to be used in the case of the accidental imbibition of this poison. We had in view the prospect that *children* might gain access to the solution, and drink it in mistake for water. We know of an instance where a strong solution of soda, such as is used to cleanse glass plates, was swallowed from a jug by a child of four years' old: serious illness followed. In another case, a child injured its hands by strong nitric acid, which was left for an instant in apparent safety. Such cases might be multiplied by a little seeking for, and it was to meet the chance of an accident occurring that we gave currency to the circular of Messrs. Harvey and Reynolds. We did not think it necessary to refrain from publishing the remedy till some one had been *killed* by the effects of this poisonous salt, however much such a proceeding might be in character with the conceited self-sufficiency which caused a member of a "liberal and learned profession" to designate the writings on this subject as "so much twaddle!" Since the foregoing remarks were written we have read in the *Bulletin* of the French Photographic Society, the following note, communicated by M. Lacombe:—"The *numerous* accidents which have been caused by the use of cyanide of potassium make me wish to see this substance banished from our photographic workshops, and to this end I send you a process which I employ for the removal of stains without having recourse to this dangerous agent. In a given quantity of water dissolve ten per cent. of salammoniac and then add ten per cent. of corrosive sublimate. This solution keeps good for any length of time. It must be carefully labelled and put away as a poisonous agent, very dangerous if taken internally, but harmless applied externally; not poisoning by absorption like the cyanide." Now, this mixture is scarcely less dangerous than the cyanide which it is to replace. If swallowed in any quantity, a painful death would follow. Here is more "twaddle" for our "learned friend," and fearing he may not be able to digest it, we will venture to submit a prescription of our own to retard its action:—Albumen, (the white of egg,) plentifully administered, is the best antidote to this corrosive sublimate or bichloride of mercury, as it is called by the chemist.

Our "Amateurs' Column" and our remarks on Mr. Jackson's paper, and the remaining portion of Mr. Hardwich's paper, have given place to the proceedings of the Chorlton Society, which came in at the last moment.

LIVERPOOL PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held at the Royal Institution, Colquitt-street, on Tuesday evening, November 17th, C. Corby, Esq., presiding.

Mr. Keith, the Hon. Secretary, reported that at the last meeting of the Literary and Philosophical Society, the privilege of admission to the meetings of that Society, to the President, Vice-Presidents, Council, and Secretary of the Photographic Society, was extended for another year.

It was resolved that the compliment should be acknowledged with thanks and reciprocated.

The Chairman acknowledged the receipt of the "Proceedings of the Historic Society of Lancashire and Cheshire," which were also ordered to be acknowledged.

The Treasurer, Mr. J. A. Forrest, exhibited a number of stereoscopic views, taken on ground glass, by Dr. Hill Norris's gelatine process, which seems admirably adapted for stereoscopic pictures—the quality of hardness so objectionable in a landscape picture forming in a stereoscopic view one of its greatest beauties. Mr. Forrest stated that all the plates exhibited were printed at once on ground glass, by gas-light in the evening, and a piece of plain glass was placed over them, which secured them from accident.

A number of stereoscopic views taken on ground glass, by Mr. Forrest, were also circulated amongst the members, which the Chairman stated would bear comparison with those produced by Dr. Hill Norris.

Mr. Forrest observed that the collodion film adhered so tenaciously to the ground glass that it could not be rubbed off.

Among other photographic illustrations produced for the inspection of the members, was a specimen of printing on opal glass, with a vignette, by Mr. Forrest. It was the portrait of a lady, printed by super-position with wet collodion, the exposure being about an instant, and developed with pyrogallic acid. It had a very delicate and beautiful effect, the rich half-tones forming an exquisite contrast against the pure white of the opal surface.

Mr. Cook presented, for insertion in the Society's album, a number of well-executed prints from wax paper negatives. The prints, which were passed round for examination, and generally admired, included views of Furness Abbey, Conway Castle, and old Bidston Church.

In reply to the Chairman, Mr. Cook stated that the prints were taken on albuminized paper, the salting solution being prepared with ten or twelve grains of salt to the ounce, with albumen diluted one-half. The wax negatives were obtained with Mr. Fitt's formula, the toning bath being prepared as follows, from a formula furnished by Mr. P. Frith:—

Chloride of gold	12 grains.
Chloride of platinum	6 „
Carbonate of soda	25 „
Water	20 ounces.

One drachm of this was quite sufficient for a picture eleven inches by nine inches. The solution should never be used twice. The picture ought to remain in, face downwards, be kept in motion by a glass rod until a [...] fect tone was obtained, when it should be fi[...] with hypo, in the dark, although he had to[...] some of them with the window-blind pa[...] drawn. It was decidedly the most satisfact[...] mode of printing they had ever tried. [...] silver should be washed out very caref[...] before putting the print into the toning b[...] The hypo was not very weak.

In reply to Mr. Forrest, Mr. Cook stated t[...] the English paper made infinitely better pict[...] than the French paper, the tone being so m[...] superior.

THE DRY COLLODION PROCESS.

Mr. Cook produced a dry collodion plate, [...]pared with Mr. Long's formula, and asked if [...] Forrest could explain the cause of the ridg[...] streaky appearance it presented.

Mr. Forrest said the bath was too weak.

The Chairman said the balance of silve[...] proportion to the strength of the chemi[...] was not duly preserved: the bath wa[...] strengthening.

Mr. Keith thought there had been too m[...] iodide in the collodion, and suggested that [...] Cook should either let it down with plain [...]lodion or increase the strength of his nit[...] bath.

Mr. Forrest said he had found that [...] Keith's collodion, diluted one-third, using h[...] ether and half spirits of wine, worked adı[...]ably, giving the powdery character to [...] dry collodion, which was so much coveted.

NOVEL METHOD OF OBTAINING STEREOSCO[...] VIEWS.

Mr. Forrest had great pleasure in draw[...] attention to a very novel and simple idea [...] originated by Mr. S. Gill, 90, Islington, Li[...]pool, and patented by him, in conjunction w[...] Mr. Newton of Jubilee Buildings, by mean[...] which stereoscopic photographs could be ta[...] with a single lens, by an ordinary camera, [...] single sitting, and with one operation. [...] mirrors were so placed together, at a sli[...] angle, that each received an image of [...] object proposed to be taken. The camera [...] then directed towards the mirrors, the ima[...] reflected in which were taken on a single pl[...] In addition to the advantage of enabling [...] operator thus to use an ordinary camera, t[...] was the additional advantage of having [...] picture correct in position, for as the mir[...] would give what might be termed a left-ha[...] view of the object, the plate in the can[...] would receive the impression naturally, so [...] in a portrait the hair would be shown pa[...] on the proper side, and if there were [...] distinctive mark on the features, it would be [...] presented in its right place. He (Mr. Forr[...]), had seen some pictures taken by Mr. Gill in [...] manner, and they were perfectly stereoscopi[...]*

Mr. Keith stated that he had tried exp[...]ments with photographing from a single mi[...], and he had always found that there wa[...] double reflection, one from the surface of [...] glass itself, and the other from the surfac[...] the silver at the back of the glass.

The Chairman observed that that arose f[...]

* We should be glad to see a specimen.—Ed. L. & M. P.

peculiar quality of the glass which Mr. ith must have used. If he had a glass, the surfaces of which were perfectly parallel, evil to which he had referred would not ur.*

PHOTOGRAPHY IN PALESTINE.

The SECRETARY remarked that Mr. Francis th, whose Egyptian views were exhibited ore the Society two months ago, when they ited such general interest, was preparing proceed to Alexandria, with the view of king his way to Palestine and the Nile, where intended to take a series of views. It was intention to have embarked on Saturday, in Alexandria steamer, which unfortunately l sailed without him, in consequence of the tain having unintentionally misled Mr. Frith to the hour of her departure. The whole of apparatus was on board, and would consently arrive out before he could reach Alexdria.

A strong sympathy was expressed for Mr. th in the annoying and vexatious dilemma which he was placed, Mr. FORREST observing it all lovers of photography could not but sh him every success in his important undering, as his views of Karnac, Thebes, &c., re the most sublime things of the kind he had er seen.

PROPOSED PHOTOGRAPHIC SOIREE.

Mr. FORREST had great pleasure in announcing it the Council of the Society had determined hold a Photographic *Soiree* in connection with association, and he was encouraged to hope it the proprietors of the Royal Institution, iere it was intended to hold the *soiree*, would ow open their museum, and that the excellent llery of art would also be accessible on occasion. It was intended that the *soiree* ould be held a week before Christmas, but re definite announcements would be made at early a day as their arrangements would able them to issue a programme. He prosed that the Secretary be requested to wait on the Committee of the Institution for the rpose of making the necessary application.

Mr. COOK seconded the proposition, which was rried *nem. dis.*

OPERATING ROOMS.

Mr. KEITH, the Hon. Sec., then read his paper "*Operating Rooms.*"

In looking over the various photographic pubations, the London and Liverpool Journals, and *hotographic Notes,* I have observed constant eniries as to the best plan of constructing a room r photographic purposes. So far as I have seen ere is as yet very little definite information on e subject, and both amateurs and professionals e left very much to their own fancies. One nsequence of this is that a great number of oms are totally unfitted for the purpose for hich they were built; another is that a great al of money and time is wasted in alterations id experiments.

Since I commenced the practice of photoraphy I have built three operating rooms, all which have, to a certain extent, answered eir purpose. In the hope that a description of them may be both interesting and instructive, I have brought here this evening plans and descriptions of them all.

The great defect of nearly all the operating rooms I have seen, is that there is too much light.* It appears to me that the great advantage of working within doors is that you are enabled to shut out the light. My early experiments in the collodion process were carried on in a back yard, surrounded on three sides with high walls, and on the fourth side a wall about ten feet high. I am inclined to attribute the measure of success which attended my efforts at that time to the fact that I had so little light.

Pictures taken in the open air are usually flat and unsatisfactory, on account of the absence of definite shadow. If taken in the sun the general effect is much improved, but they must then be considered rather as pictures than portraits, as the face is so much shaded as in many instances not to be recognizable.

When I commenced the practice of photography in earnest, I could of course no longer work in the back yard. I therefore built my operating room No. 1. The house I then occupied had a balcony about 5 feet wide, and 18 feet long; this I covered in with glass. The front was made in four frames, each 4 feet 6 inches wide, and 7 feet high, screwed together at the sides. The roof was also made in four pieces, the two centre pieces of which turned up against the wall. This mode of construction added a little to the expense, but enabled me afterwards to take it down with very little trouble. About this time Mr. Barker built a glass house in his garden, very much on the same principle, which answered very well. I was at that time of opinion that the more light I could get the better; and as I had light only at the top, front, and one side, I whitewashed the wall to prevent too deep a shadow. The pictures I then obtained were very unsatisfactory, and quite inferior to those taken in the back yard. I therefore commenced to shut out the light with blue calico, but without any improvement in the result. I then obtained some thick brown paper, quite impervious to light, and went on gradually shutting out,—first the front, then the side, then the top, until the only light admitted was from the two middle frames of the roof. I also found that the whitewashed wall was not only unnecessary, but prejudicial, and there also I nailed up a large sheet of brown paper. I then obtained pictures, which, as far as light and shade went, were everything that could be desired, and what may at first appear stange, without any increase in the time of exposure. I may here mention that this brown paper is a very useful article in experimenting with the light. It is inexpensive, and very readily tacked up and taken down.

My next essay at photographic architecture was at the rooms I now occupy in Castle-street. At that time they consisted of two rooms, with a dark attic. My ideas of light were by this time considerably modified, and I contented myself with cutting out the ceiling of the front room, removing the slates and joists up to the

* Even with parallel surfaces the double image is produced.—D. L. & M. P. J.

* The room we described as existing at Rouen was free from this defect. Mr. Keith must have overlooked our description of it.—ED. L. & M. P. J.

ridge, allowing the purlins to remain, and putting in a skylight about 13 feet by 10 feet. The front room occupies five-eighths of the entire space; the piece of ceiling between the ridge and first purlin was allowed to remain.

You will observe that I was a long way from the light. In summer I found this no disadvantage, but in winter the light was very poor. I therefore put up a platform at the back of the room, about 5 feet wide, and 6 feet from the floor, but as the pictures obtained there was not at all satisfactory after trying it about a month, I had it removed (this experiment cost me about £10, in addition to the trouble and annoyance). I then had two platforms made, 2 feet 6 inches high, 6 feet long, and 4 feet 6 inches wide, one for the sitter and one for the camera, and in this room I worked for about three years with great success, and the plan is one that I can with confidence recommend for general use. The cost is not excessive, and where a very large room is not required, it leaves little to be desired. The only disadvantage is that the top light is rather strong, and consequently the shadows are sometimes rather heavy.*

I now come to the room No. 3, the one I now occupy, which fully answers my expectations. It is sufficiently large for all ordinary purposes. It is beautifully lighted, and I am enabled to obtain any effect of light and shade I require. It has been formed by raising the back and side walls, and roofing it entirely with pale blue glass. The advantages of this are so numerous, that I do not think the additional expense should be a bar to its employment.

The first impression on entering an operating room is generally one of discomfort and irritation, on account of the immense quantity of light. This is entirely obviated in my present room, for there you have no idea that the light is stronger than ordinary. The pupil of the eye under the action of a strong light contracts, and the result of this is the stupid, half-drunken appearance of many photographic portraits. My former room was glazed with ordinary sheet glass. During the first summer I obtained pictures in three or four seconds; the second summer it took six or eight seconds, and this year the sittings were prolonged to ten or fifteen seconds. I was at a loss to account for this, until my attention was called to the fact that ordinary window glass exposed to the action of long continued sunlight rapidly changes colour. At a recent meeting Mr. Forrest exhibited some pieces of glass from a skylight, which had changed to a reddish purple, while the portion sheltered by the putty retained its original colour. In my case the glass had acquired a decided yellow tinge, which materially impeded the action. Under the blue glass I have, during this month, obtained pictures in five seconds, and in fine summer weather the action was almost instantaneous. How the blue glass will retain its colour can only be decided by time, but from the nature of the material employed, cobalt, I have every reason to believe that it will be permanent.

My new room may be considered as divided by the purlins into five portions. The first o[r] lower portion is devoted to the dark room. Th[e] next three are glazed, and the fifth portio[n] sloping down to the back wall, is slated an[d] plastered. The whole of the glazed portion i[s] supplied with black blinds, and many person[s] have been surprised at the small portion of lig[ht] which I use. If I have a full flat face I shut o[ff] all the light except from the upper portion; f[or] ordinary working I use the second portio[n] shutting off the light from the top of the hea[d]. If the features of the sitter are thin, and th[e] eyes deep set, I shut the two upper portions an[d] open the third, by which means I get a broa[d] light upon the sitter. As the sitter, I may sa[y] faces the light, I can obtain any amount [of] shadow upon either side of the face by partiall[y] drawing the curtains on that side. Operatin[g] rooms are generally coloured or papered of [a] light colour. This I consider objectionable, [as] trying to the eyes. My walls are coloured [a] dark grey, almost black, so that it answers f[or] a background at any part of the room, and [as] the sitter is placed he is generally looking in[to] a dark corner. The result is that the expressio[n] is easy and natural, and that unpleasant refle[c]tion in the eyes is entirely avoided. I have al[so] a background made like a large cheval glas[s] with a different colour on each side, so that [I] have the choice of three backgrounds. Th[e] ventilation is amply provided for by a lar[ge] door opening to the front, a skylight opening [at] the bottom, a window on each side, and ventila[t]ing bricks in each side wall at the top.

You are probably aware that my practice [is] almost confined to positives; how far the roo[m] may answer for negatives I am not at prese[nt] able to state, but my present opinion is th[at] they require more light, and that a lengthen[ed] exposure in a weak light will not produce th[e] same effect.*

Mr. Forrest said the paper they had ju[st] heard was most important and instructive. [He] felt this especially, as he was receiving lette[rs] almost every morning from amateur phot[o]graphers, requesting information on the subje[ct]. It was especially gratifying thus to see a prof[es]sional gentleman freely giving them the bene[fit] of his well-studied and successful experien[ce]. He had very great pleasure in proposing a vo[te] of thanks to Mr. Keith for his valuable pap[er] which, being duly seconded by Mr. Cook, w[as] passed unanimously.

Mr. Keith, having stated that the adaptati[on] of the dark blinds arose from a suggestion ma[de] to him by Mr. Corey, acknowledged the comp[li]ment paid by the meeting.

THE NEGATIVE BATH.

Mr. Glover then read the following paper "*The Negative Bath*:"—

The state of the negative bath is a matter [of] the greatest importance to the photograph[er]. Whatever degree of perfection he may ha[ve] attained as a manipulator, however pure [his] chemicals, and whatever formula he may ad[opt] in the preparation of his secondary solutio[ns], unless the nitrate of silver bath be in pro[per]

* MM. Gerotwohl and Tanner work, in Paris, in an *orthodox* artist's studio. The sitter is placed on a stage. The light is high, and of small extent. In London more light is required to work in all seasons.

* M. Belloc, of Paris, produces excellent *negatives* w[ith] much less light than is ordinarily employed. Mr. Keith's [ex]perience is very valuable, more especially as regards the posi[tive] process. Does not the nature of the collodion influence [the] lighting?—Ed. L. & M. P. J.

·king condition, his efforts are fruitless, as as regards perfection in this beautiful art is cerned. True, it is possible, with an ineffi- it bath, &c., to obtain images by the agency light, the novelty of which, even with uninitiated public, is not a sufficient irantee for anything short of a faultless pho- raph. We shall therefore enquire, without ering into the best established mode of pre- ing a new bath, what constitutes an imper- t bath, with the various causes and the iedies.

llkalinity is fatal to all attempts at photo- ·phy. The cause may be generally traced to presence of carbonates in the iodides or mides used in the collodion; a small portion ·hus introduced into the bath with each plate, ·il it has an alkaline reaction. Another cause y be the presence of free ammonia in the lodion. To counteract this, it is usual to add ·tic acid, but we prefer the use of nitric acid, obvious reasons, to which we shall hereafter l attention.

Another, and we may say the most general ıse of failure is, the presence of *nitric acid* in *intity*. The cause may be attributed to the of collodion containing free iodine, which no erator would wish to be without. It is ident to those who understand only sufficient emistry to carry them through the process, it if the collodion contained only pure iodide potassium, the decomposition would be as lows:—

$$KaI + AgO\,NO^5 = AgI + KaO\,NO^5$$

that, consequently, no free nitric acid could ist; but the case is far different when free line is present. Having a greater affinity for e silver than nitric acid has, the iodine takes place, liberating free nitric acid. There is substance present with which it can com- ıe, consequently, it must accumulate in the th.

The usual remedy for this has been the dition of ammonia till neutrality, or rather a ght alkalinity was obtained, causing a small ıantity of oxide of silver to be precipitated, trate of ammonia being formed in the solution, etic acid was then added, which, uniting with e oxide of silver, formed acetate of silver. his fact requires special attention, as reference ill be made to it in a subsequent part of this iper. Instead of the above, some recommend e addition of other alkalies, such as carbonate potash or soda, both of which precipitate, ırbonate and oxide of silver, which have to be parated by filtration, thus abstracting the lver from the bath, at the same time a new ıbstance is left in solution, nitrate of soda or otash.

Others recommend the use of a piece of marble ı the bath (carbonate of lime), which certainly attended with the least trouble and incon- enience, no precipitate being formed of any onsequence; but, there is one great objection, he formation of nitrate of lime which is held in olution. We shall withhold further comment n this subject for a distinct and most impor- ant head of this paper.

Among the rest of the causes of failure we ıay enumerate the presence of foreign sub- tances in the bath, produced by the decomposition of the re-agents that have been from time to time added to correct the acidity or alkalinity, and to which we called special attention in the foregoing part of our paper, viz.:—*acetate of silver*. This salt is decidedly prejudicial, the plates being more liable to stain when it is present. The least carelessness in the cleaning of the glass is made doubly visible in the finished negative, and one of our greatest photographic chemists (Hardwich) asserts, not only the above, but that the presence of acetate of silver tends to solarization from over exposure, causing the peculiarity which most of us have observed, a light transparent red colour in the high lights of the negative. For this reason we object to rectify an alkaline bath with acetic acid. When once alkalinity occurs, some oxide is thrown down, this is re-dissolved by the acetic acid, consequently, acetate of silver must be present. It is also very probable that other substances, such as nitrate of lime, nitrate of ammonia, &c., before alluded to, are best dispensed with, if we can attain our object without them.

Other minor causes of failure might be enumerated, though not strictly chemical. Some photographers are so sparing of their nitrate of silver as to mix only sufficient solution to fill their bath-holder; by this method, unless the solution be continually filtered, which entails considerable loss, spots will be produced in the film, by the floating particles, and those in suspension subsiding on the surface of the plate. We would recommend every individual to make twice the quantity of solution he requires, so that he can pour sufficient off for his use without disturbing the sediment, by which he will be a gainer, no loss by filtration being required.

The tendency to this practice may perhaps have increased since the introduction of those useful portable bath-holders, with water-tight tops. It was never intended that these should be the *only* receptacles for the solution, but were constructed for the convenience of the tourist only.

Another minor cause of failure may be from weakness of the bath, caused by the abstraction of the silver, without sufficient being added to make up for the loss. We do not recollect to have seen any rule laid down, but the calculation is very simple. For every ounce of collodion used, containing four grains of iodide of potassium, nearly $4\frac{1}{10}$th grains of nitrate of silver are removed. Of course, the quantities vary with the use of bromides, or of other combinations of iodine, the atomic weights of which are easily calculated. I may just remark here, that although the silver is removed from the bath by continued working, the specific gravity is very triflingly altered, as in the use of the metallic alkalies as iodizers, one metal only takes the place of the other in the bath. Iodide of *silver* forming in the collodion film, and nitrate of the oxide of *potassium* remaining in solution.

It is an error to suppose that the "specific gravity" and "yellow tinge" are owing to the redundancy of iodide in the bath, as after it has once been saturated at the time of preparation no more iodide can possibly be absorbed, whatever volume it comes in contact with. The yellow colour is most probably owing to the

organic matter in contact with the nitrate of silver or nitric acid. Water has the power of separating the iodide, consequently when it is added to the bath a portion of iodide is precipitated, but if the water be again evaporated the iodide is re-dissolved.

The foregoing are the chief causes of failure in the negative bath, and in entering on the most important part of our paper, the point at which we want to arrive is, the means of neutralizing the nitric acid without the introduction of a foreign or deleterious substance, which will always occur, as we have shewn, when a substance is added which effects a mutual decomposition. We will, therefore, give the results of a few experiments with a view to this object.

Metallic silver was introduced, but it is very slow in its action, the nitric acid being so dilute. A difficulty presents itself in procuring (commercially we mean) pure silver for the purpose, our standard metal being alloyed with copper, therefore forming nitrate of that metal as well as silver.*

Pure oxide of silver was then introduced into an acid solution of nitrate of silver. We obtained the oxide by precipitation from nitrate of silver by ammonia.† The precipitate well washed with boiling water, to free it from the alkali, presents a finely divided surface to the attack of the nitric acid, and answers tolerably well. We allowed twenty or thirty grains to remain in the acid solution for a day or two, shaking up occasionally. The uncombined oxide subsides to the bottom, and the clear and *nearly* neutral solution can be decanted for use.

The last and highly satisfactory experiment we performed was founded on the chemical theory, that *carbonic acid* has a greater affinity for the base *silver* than that of *sodium*, and, secondly, that *carbonic acid* is displaced by *nitric acid* without the presence of a second base. We selected as a good subject for our experiment an old positive bath, prepared by the French formula, and we think resembling that used by our worthy Secretary. The problem to solve was to convert this excessively nitric acid bath into a negative bath. The quantity to work upon was about twelve ounces, containing say twenty-five grains to the ounce, having been some time in use. We took three ounces of the above solution, added a solution of bicarbonate of soda till the whole of the silver was thrown down in the state of carbonate, taking with it a small quantity of oxide of silver. This precipitate we thoroughly washed with boiling water to remove every alkaline trace. Carbonate of silver, as most are aware, is, when newly prepared, a white powder, insoluble in water. This, when added to the other nine ounces of acid solution, almost immediately neutralized the nitric acid with considerable effervescence, owing to the escape of carbonic acid gas, described thus:—

$$AgO\,CO^2 + NO^5 = AgO\,NO^5 + CO^2$$

Thus we not only neutralized the nitric acid, but concentrated into nine ounces all the silver contained in the original twelve of acid solution. We submit the first negatives taken wit[h] the altered bath.

In conclusion, we beg to propose, by th[e] same plan somewhat modified, to collect th[e] silver from our washings of prints, old bath[s] &c. The plan is to precipitate the silve[r] as carbonate, which will shortly subside, s[o] that the then valueless liquid can be syphone[d] off and thrown away. Water poured on, an[d] the same washing repeated several times. Th[e] carbonate must then be collected on a filte[r] boiling water poured over it till all the soda i[s] removed, then dried, and pure nitric acid adde[d] to saturation. By this means we get a stron[g] solution of nitrate of silver, which can be teste[d] by the hydrometer, or evaporated and crystalize[d]. This is attended with remarkably little troubl[e] and cost compared with the old process of pre-cipitating as chloride, reducing to the metalli[c] state, and re-dissolving in nitric acid, whic[h] requires some skill and apparatus not always a[t] hand. Thus every photographer can reclai[m] all his waste silver in the most valuable for[m] for his purpose.

Since writing the above we performed th[e] following experiment:—120 grains of nitrate o[f] silver were dissolved in about one and a hal[f] gallons of water. The silver was precipitate[d] as carbonate, the liquid syphoned off, and th[e] washing repeated several times. In running of[f] the last water we syphoned rather too close and lost about ten grains of silver, making 11[0] to work upon. Without filtering or drying w[e] added pure nitric acid, drop by drop, till th[e] whole of the carbonate was changed to nitrate. We then added about a quarter of a grain o[f] iodide of ammonium, and made the whole up t[o] three and a half ounces with distilled water. After filtration, we prepared a collodion plat[e] and made sensitive in the above solution, an[d] now lay before you the result.

Mr. Glover received unanimous and heart[y] thanks for his interesting paper, which he illus-trated by several practical experiments.

The meeting soon afterwards adjourned.

CHORLTON PHOTOGRAPHIC ASSOCIATION.

The sixth ordinary meeting of this Society wa[s] held in the Chorlton Town Hall, on the 12t[h] instant, Mr. Hepworth, V.P., in the chair.

After the usual preliminary proceedings,

Mr. L. E. Whaite read the following Pape[r] "*On Colouring the Backgrounds of Collodio[n] Positives.*"

In a recent number of the *Liverpool an[d] Manchester Photographic Journal*, there appear[ed] an article on colouring backgrounds of collodio[n] portraits, in which the writer expressed a wi[sh] that some additional information would be give[n] by any one conversant with this interestin[g] subject. Having in my own practice, as a[n] amateur, adopted a method which, after repeate[d] trials, I have found completely to answer m[y] expectations. I take this opportunity of com-municating the information.

What photographer, whether professional o[r] amateur, is there that has not met with a spott[ed] or stained background? and perhaps, on th[e] same plate, has obtained an exceedingly goo[d] and faithful portrait, but, in consequence o[f]

* Some of our London bullion dealers sell *pure* silver. Copper will precipitate pure silver from the nitrate.—Ed. L. & M.P.J.

† Would not *potash* be the best precipitant?—Ed. L. & M.P.J.

ts and stains, has destroyed the picture, and n laboured again and again to obtain the ner happy expression, but alas! in vain. It y be that the background is clear, while re is too much of the same tone throughout picture, and a ghastly look is thereby given the sitter. Again, every operator is aware the great difficulty in taking portraits of ldren who will not remain quiet, unless held their parents or nurses; these, being behind child, would of course be visible in the otograph, and disappear only when the back-und is put in. Unquestionably, pure photo-aphy is at all times to be preferred, yet it quently happens that circumstances such as se described above, will so deteriorate the pression, that some additional aid is required, erwise, very many attempts might be requi-c to produce a picture which would be satis-tory even in a moderate degree.

The first thing to be done is, to free the rface of the plate from all grease, or any purities of gum contained in the varnish. is is done by washing it over with a few ps of liquid ox gall, and wiping it dry with soft handkerchief or *dossil* of lint.

I may say that, without this precaution, the lour will shrink from its original place, and ve a sort of halo around the figure.

Having decided on the tint of the back-ound, say for instance a grey, or any other utral tint, I take a small quantity of black d blue of the ordinary photographic powder lours, and a little of the liquid ox gall, inding them, or rather mixing them, with a all palette knife on a piece of ground glass, ding a small quantity of moist Chinese white, hich gives a body to the colour and renders it aque. I also add a small particle of red to ve warmth to the grey.

The colour having been well mixed, I then oceed to lay it on the plate with a sable ush, which is to be done as quickly as possible, king care not to colour over the outline of the gure. After having worked round it, I take a rger brush and fill up the remainder of the ckground; then I stipple with a swan-quill or rge camel-hair brush, which destroys all traces f previous brush-marks which may have been ft by the sable brush, and not only gives an ven granular texture to the background, but erves also like so many cells for the reception f dry powder colours, which fill up the cavities nd attach themselves readily and firmly to he groundwork—in the course of a few minutes he ground is dry. I then proceed to lay on he dry powder colours with a small short amel-hair brush, thus gaining a more even urface, and producing with the powder colours ll the graduated tones of a beautiful painting. astly, the excess of powder colours is to be usted off; then, with a moist brush, clean over he figure, taking care not to touch the back-ground.

These observations will be more fully under-stood by a reference to the specimens on the able, and I have only to add, that this process s not difficult; it requires, like the rest of hotographic operations, a little care and prac-ice to enable the operator to produce a eautiful picture, varying not only the colour, but the respective shades at pleasure, so that a true artistic effect can be given.

Mr. Alfred Deane then read a paper "*On the Preparation and Properties of Gun Cotton*," but the copy for which arrived so late that, although in type, we are unable to find space for its insertion in the present number; it will, however, appear in our next.

The business of the evening terminated with a vote of thanks to Mr. Whaite, Mr. Deane, and to the Chairman.

The next meeting will be held on the second Thursday in December, at eight o'clock in the evening, when Mr. Deane will read a paper containing some original information on the bath, on photographic varnishes, the different processes of colouring photographs, and the comparative permanence of different kinds of photographs, illustrated with specimens and experiments.

REMARKS ON PHOTOGRAPHY.

By C. Burnett, Esq.

Mr. Burnett has favoured us with the following report for insertion in this *Journal*:—

At the July, 1857, ordinary meeting of the Scottish Photographic Society, W. Walker, Esq., in the chair, some specimens of unburnt photography on glass, parian, and porcelain having been exhibited, the Hon. Secretary mentioned that Mr. Burnett had some communications to make to the Society on the subject of photography on such materials.

Mr. Burnett then remarked that he had been long trying* to stir up our photographers to immortalize their works on porcelain, glass, and allied imperishable materials, and was much pleased to see the interesting specimens then exhibited, but must, at the same time, fairly tell them that,—although by preparing the surface for the reception of an ordinary silver picture and subsequent varnishing, we might, as these specimens exemplified, produce tolerable, or very good, photographs, and find porcelain and allied fabrics—in some respects convenient supports for an ordinary picture (it might be for one with other materials)—to give photographs, on such fabrics, their only real and characteristic value, the photograph must be burnt in. It was only thus that the photograph could be made to partake of the imperishability of the fabric on which it was placed. The great obstacle and cause of failure, or poor success in the attempts at burnt-in photography which had been hitherto made, arose from the change of colour which the silver photographs underwent, generally turning yellow in the process of burning—nothing standing more in the way of progress here, as well as elsewhere, than the notion, which photographers in general seemed to be possessed with, that everything must be done by silver. In photography which was to be subjected to the action of the furnace, he must lay it down as a law, and it was only by directing all our efforts in subservience to this law, that we could hope to get results worth having. We must direct our attention exclusively to the colour which the substance,

* Both privately and publicly, see report on February paper, in *Photographic Notes* of May 1, page 162.

or mixture of substances, of which the photograph was composed, would assume after the operation of burning, not to that which it would present before burning. These two colours, it would be found, were by no means necessarily, and were seldom the same—frequently altogether unlike. These changes of colour had been long known and carefully studied by the painters, stainers, and decorators of pottery and glass, having to be allowed for in all their operations; and their recorded experiences as to colours obtainable from various oxides, and their mixtures, as well as their respective fixities in the furnace, and the methods of burning-in, should be carefully studied by photographers.

Next, as to the *practicability* of procuring photographs with more suitable substances than silver, he had been engaged at intervals, during the last two or three years, in an extensive series of experiments with a great variety of chemicals, partly to try whether he could not find some material at once less costly and less subject to change than silver for our ordinary paper photographs; but also, in a great measure, he might almost say principally, with a view to burnt-in photographs on pottery and glass, to the production of photographs containing such substances as would give black, brown, or other generally useful tints, after their passing through the fire. He had already published, in a little fragmentary pamphlet,* the remarks in which as to the desirableness of producing from nature decorations for our pottery, tiles, &c., as well as other of our remarks about photography on curved surfaces, &c., were intended to apply equally to true photography on porcelain, the means by which black, one-coloured, or many-coloured impressions from photographically-prepared stones or plates might be produced on porcelain or glass, and the principle, as far as the study of change of colour, was the same as he now described and insisted on. As to the mode of application of the photograph to the surface, in the case of the true photography with which they were now concerned, he named, amongst other varieties, the burning-in a print made with suitable materials, as preparations of chrome, iron, copper, gold, uranium, &c., or their combinations, or suitable preparations of them applied to a film of collodion, albumen, gelatine, dextrine, silica, alumina, or other suitable substance, or mixture of substances, with which the porcelain or other fire-proof material has been coated. The organic matter would burn away in the furnace, and the fixed oxides, or other substances or compounds contained in the photograph, would sink down and amalgamate with the substance or the outer coating of the vitreous or ceramic material. Photographs on paper and other materials (and films of albumen and collodion, &c., with the photographic impression on them), might also be, he would suggest, after they were printed, attached to porcelain, &c., by an organic or inorganic cement, and all organic matter burnt away in the furnace as before. In this case, and we might also apply it to the film in the former case, he then would recommend for trial the application of some inorganic flux or vitrifiable substance, as borax, boracic acid, borate, silicate, or other substance, or mixture of substances, to the paper or other film, either after its cementation to the porcelain or glass, or before its cementation, or this application might be made to act also as the cement. Such an application might promote the amalgamation of the oxide contained in the photograph with the fire-proof mateiials on which it is placed, as well as promote the fusion of the paper ash, and might, in the cases of pottery or other tablet, serve as its glaze, or might assist the vitrification of the surface. Nitrates, or chlorates, either alkaline, metallic, or earthy, and many other substances might be useful.

As to the photographic chemicals which might be available for this photograahy, iron, copper, chrome, uranium, cobalt, gold, tin, manganese, nickel, bismuth, antimony, lead, titanium, tungsten, molybdenum, and probably other metals were likely to be more or less available, many of them much more usefully so than silver, which, instead of being exclusively looked to, must be looked to as only an occasional variety for certain colours, or along with other metals.

As to the means of their obtaining photographs with the desirable metals or their oxides, they might be many. His experiments pointed out that chromic acid, and the chromates applied in various ways, would enable us to fix photographically, or obtain photographs containing a considerable variety of metals likely to be useful. The ferrocyanides and ferridcyanides, and other allied salts, also came into play here, along with chromates, as also separately in other ways (*e. g.* by themselves or with uranium or other metals). Copper, iron, and chrome, separately, or in combination, any two or all three of them, from their inexpensiveness and their fixity in the fire, were particularly deserving of attention. Copper and iron oxides, in combination, were already in use by porcelain printers, and furnished, after burning, a good dark colour, such as would be suitable for landscapes, portraits, &c., &c. These dark colours and blacks obtained from the burning-in of photographs containing the already-mentioned oxides, or such other mixture of oxides (as cobalt and iron, cobalt and copper, cobalt, iron and copper, cobalt and iron or copper and manganese, &c.), as were in use in glass or porcelain staining, or as might be found to answer, or blacks of uranium, were, of course,

* Photography in Colours; a Fragment. Published by Edmonston and Douglas, Edinburgh; Hamilton, Adams and Co., London, June, 1857; and republished in *Notes* for August, Is it not rather amusing to find Mr. Thomas Sutton, after publishing in his *reprint* of my pamphlet months ago, in his *Notes*, this plan of mine for burning into porcelain impressions or prints from photographically-prepared stones or plates, now trying to bring out the very same thing as a novelty of his own. This very remarkable *re*-suggestion was first made in *Notes* of 1st October, page 365—"It has occurred to us that photographs might easily be printed on paper, in coloured inks, from photo-galvanographic or photo-lithographic plates, and sent to the potteries to be burned into crockery of all sorts." On the receipt of the *Notes* containing this, I wrote Mr. Sutton, quietly calling his attention to the fact that he was bringing out as his own what he had already published as mine, and calling attention to Mr. Poitevin's new form of photo-lithography, as especially suited for the carrying out of this plan. Well, what sort of acknowledgment does Mr. Sutton make of this? what step does he adopt to clear himself from any possible suspicion of the intention to appropriate the property of another. In the last number of the *Notes* (Nov. 15), adding to it this new hint, he again brings the plan before the public, *still as his own!* Mr. Sutton writes me that my papers are "very suggestive,"—so are the pockets of one class of her Majesty's subject to the fingers of another.

great desiderata, but at the same time it s well to know that we had, at our command, variety of other and bright colours, as from balt, chrome, silver, lead, antimony, uranic de, &c., which might be brought into play the coloured decoration of pottery, glass, or ied materials with true photographs,* either nple photographs or kaleidoscopically comned. For compound colours and neutral ts, we might be considered as well prepared, there was no difficulty in fixing any reasonle number of oxides at once in one photoaph, through the instrumentality of the romates, with or without the assistance of her metallic salts, and ferrocyanides or rridcyanides, and other metal-cyanic salts.

Various circumstances, as well as his time, wing been much taken up with a variety of periments in other directions as well as that photography, had interfered to prevent his wing here any burnt in specimens on porcein or glass to show them, but he would show iem a few practical results on paper, the sults of his experiments with some of the etals which he had recommended, and he had hesitation in saying that, by calling attention the cause of previous want of success, and by binting out the direction in which we must ok for a remedy; and the practicability, hich he came prepared to prove to them, of roducing photographs containing the suitable ıbstances, he had removed at once the great ifficulty which had been allowed hitherto to tand so formidable in the way, and placed it at nce in the power of any person of ordinary ıtelligence and capability,† having the proper ıaterials and appliances at command, to produce a really good dark coloured burnt-in photograph on porcelain, glass, and allied materials.

These remarks, giving the only means of attaining a really useful or valuable true burnt-in photography on porcelain, glass, tiles, enamelled surfaces of metal, stone, brick, &c., had been excluded from the little fragmentary pamphlet before alluded to from want of space in its single sheet; but he had much pleasure in now communicating them freely to the public, and to put any attempts at monopoly out of the question;—lest any one should think of taking out a patent for them, he would now place in the hands of the Honorary Secretary the notes from which he had read. After shewing some specimens of ink photographs, with remarks, and some green photographs of leaves, (the colouring matter being Prussian blue, along with yellow nitro-prusside of iron,) the latter interesting to contrast with the brown autumnal-looking specimens he would next show them, and remarking that all these processes, as well as the cyanotype prints, &c., might be applicable to burnt-in photography, from the iron they contained. Mr. Burnett then proceeded to show a variety of specimens illustrative of photography, with materials suitable for burning-in, and to give explanations and answer questions as to the processes by which they were obtained or might be obtained. The red-brown autumnal-looking photographs consisted of ferrocyanide of copper. They are obtained by—1st, preparing paper with a mixture of bichromate of potash and sulphate of copper; 2nd, exposing in pressure frame under negative; 3rd, washing it to get rid of unacted-on chemicals, (a little citric acid being added to the water); 4th, developing it more fully by a bath of ferrocyanide of potassium; and, 6th, washing again and drying. There were other ways of obtaining the same result, some of which no doubt would be preferable, as by substituting an alkaline bichromate less soluble, and giving rise to less soluble products as well as less stable, we would both quicken the printing and prevent crystallization, which was sometimes apt to be troublesome. With the latter view also nitrate of copper might be substituted for sulphate. He expected also to find the substitution of a pure bichromate of copper for the mixture of salts an improvement. It was only as applicable to burnt-in photography that he then brought these prints before them. Their red colour would interfere with their being generally valuable for our ordinary printing, but there was a method of toning them (by iron) by which he expected to get rid of the red tone and to produce photographs suitable for all purposes. He hoped by such toning to bring copper printing into general use as a formidable rival to silver, and the toning would probably also add to the value of the photograph for burning-in by adding more metal to it. He answered enquiries as to the probable permanence of such photographs in the unburnt state, &c. The very distinct and dense olive-brown photograph was obtained on paper prepared with bichromate of potash and sulphate of maganese. Some other photographs shown, contained mixtures of copper or cobalt, with maganese and chrome, &c., mixtures of several metals being obtainable either by mixture in the paper

* For all decorative purposes (kaleidoscopic and non-kaleidoscopic), photographic and other, we would direct particular atention to the Diatomaceæ, Foraminifera, and other microscopic rms.

† *E. g.* Mr. Forrest, who, at the last meeting of the Liverpool Society, not only brought out, as something entirely new and ut of his own head, my already published plan (see *Journal* for August) for getting rid of the obstacle which had hitherto obstructed all progress towards anything like a good burnt in photography on porcelain, enamel, glass, and similar fabrics, by substituting other materials, on the principle of attention to their burnt colours for silver, but actually brought out, on the same occasion, describing it step by step as his own, my copper-printing process (cuprotype), as published, both in the same August *Journal* and in the *Photographic Notes*, particularly in one number, in a letter of mine, in connection with the contents of which Mr. Forrest had actually written to me for information! and had a reply from me giving it. I am of opinion that the public is often most unreasonably bored about questions of priority and originality in mere trifles; but, where a man has freely made a gift to the public of an invention by which he might, had he chosen to make a patent monopoly of it, have coined thousands of pounds, he has some little right to ask that the acknowledgment due to him should not be given to another. I need hardly put the question, is it at all likely that a practical dealer and manufacturer, such as Mr. Forrest, would have been willing to forego such an opportunity of making a fortune, or would have made a free gift to the public, had it been in his gift or refusal of a secret of such value? Mr. Forrest would have shared with his brother manufacturers the profits of the opening up of a new branch of art, and he might have been content with this. At the Liverpool meeting, and elsewhere, Mr. Forrest has recorded nothing, as far as I can see, but substantial failures, from the employment of silver, till after the date of my suggestions for the substitution of other metals, on the principle of attention to their burnt colours. Has Mr. Forrest shewn that, up to the date of my suggestion, he had done anything more than hammer away, painfully and helplessly, as others had done before him, at the useless silver, or that *since* he has done anything more than carry my plan into practice, with the advantage of the furnace, the want of which "he so much regrets must prevent his brother Photos from carrying on any such experiments?" The only thing like an original idea which I have found in his paper, and for that he conscientiously acknowledges himself obliged to the suggestions of a friend, is the having found out that milk produces a film better adapted for carrying out such processes than starch.

preparation or by their after addition. Among the cobalt photographs shewn, the very dark brown ones, which might deserve consideration for unburnt photography as well as for burning-in, had been prepared by toning chromate of cobalt prints with sulphuretted hydrogen and sulphohydride of ammonium. The uranium and iron photographs were their old friends of last Exhibition, and which he had explained in his paper of February, when he had also called attention to them and others in connexion with burning-in. In his allusion to burning-in in that paper, as printed in the *Photographic Notes*, the word silver was somehow substituted for copper. The gold photographs were developments of iron-prepared paper (Sir J. Herschel's chrysotype), and of uranic papers, and highly gold-toned ordinary silver prints. The most desirable gold-print would be one containing it in union with tin, and he hoped to succeed, but had not yet, in getting any good photograph of this description.* Hunt's silver chromotype should be tried with or without addition for colour-printing. As to his own chromic printing processes, the specimens shewn were all on paper, but his experiments pointed out that they were likely to be equally available on animal and vegetable films, as albumen, gelatine, dextrine, &c., so as to be applicable in this way for burning into porcelain, glass, and allied fabrics. There would be no use in then entering into any further particulars of his chromate processes. For further information he referred them to the accounts which would be published.† His intention was to communicate the whole freely to the public, so that any one might be able to give them a trial, either as far as any of them were adapted for positive printing on paper, &c. (porcelain and glass being here also, though much less importantly, included), or for the system of burning-in on porcelain, glass, tiles, enamel, metal, stone, slate, &c., as regulated by the burnt colours in connection with which they had been then brought forward, and which he had no doubt would give results of the very highest value in a vast variety of ways.

ON THE METHOD OF PRODUCING MINUTE PHOTOGRAPHS.‡

By W. Hislop, F.R.A.S.

Read before the North London Photographic Association, October 28th, 1857.

The particular department of photography which I have the pleasure of bringing to your notice this evening, is worthy of attention, on account of the remarkable manner in which it exhibits the extraordinary capabilities of the art.

I propose to explain the method of producing exceedingly minute pictures, either reduced from others, or taken direct. The term "micro-photograph," has been improperly applied to enlarged pictures of microscopic preparation. This process being one of enlargement, is exactly the reverse of that which we have to consider to-night, and I conceive that the word micro, signifying small or minute, can only be correctly applied to reduced and not to enlarged figures. The exceeding minuteness of the pictures which can be produced can hardly be conceived by those whose attention has not been directed to their productions. As some indication of what may be done, I may refer you to the specimens which have been arranged beneath the microscopes before you, some of which contain elaborate groups within the space of the sixteenth of an inch, in which every detail is preserved, and even inscriptions may be read with ease. The material employed, too, admits by skilful manipulation, of all the effect of tone and contrasts of light and shade, which go to make up a perfect picture, being produced at will, and repeated to any extent. Although there are some who doubt the utility of pictures so small as to require a microscope to see them yet I believe that any one who has seen a good micro-photograph, properly exhibited, will admit that this class of photographs may certainly be reckoned among the wonders, if not among the utilities of the art.

It will easily be seen that the manipulation of this process must be extremely delicate, the materials should be of the finest quality; the instruments used most perfect in their adjustment; the subjects selected with judgment; and last, but not least, patience and perseverance on the part of the operator are essential to success.

Two or three photographers and microscopists, besides myself, have worked in this department, but, so far as I know, have not given the details of their manipulation to the public. Having worked it out independently, I have thought myself at perfect liberty to reveal what I have done, the more so, as I hold as a principle in science, that he who wishes to accumulate information, ought also to be willing to impart the information to others.

Having myself been led into photography by its connection with the microscope, and knowing that those who have succeeded with these small pictures are also microscopists, I am induced to believe that a knowledge of the management of a microscope is of great importance in the process. The requisite delicacy of manipulation is difficult of attainment, and even a microscopist will not always succeed.

I will now, after these preliminary remarks, proceed to tell you my own method of procedure:—

First, as to the materials. All the various sensitive surfaces may be used, but I prefer collodion on glass. The pictures are best as transparent positives. The glass used should be the best thin plate, in the form of microscopic slides, three inches by one, and as neatness of appearance is important in every thing relating to such minute productions, I prefer that the edges should be ground smooth and polished. Such slips of glass are spuplied by Messrs. Claudet and Houghton, at 10s. per gross. Each slide should be carefully examined by a magnifier, and those which have scratches or specks of any kind should be rejected. When the picture is finished and dried, it is

* We would suggest the burning-in of a gold photograph on a surface of porcelain or glass already containing the oxide of tin, which, by itself, is white.

† See *Journal* of the Photographic Society for August, page 21, and *Photographic Notes* of Sept. 1 and 15, &c.

‡ Obligingly communicated by the author, and here given *in extenso*.

covered with Canada balsam, and a piece of thin microscopic glass placed upon it. Discs may be obtained cut to any size, also, of Messrs. Claudet and Houghton.

The collodion I use is positive, rather thin, and producing an opalescent film. It is obvious that it must be perfectly structureless, and here is one of the most serious difficulties which we encounter. For, I may safely say, nine cases out of ten, the pictures will be found to look as though covered with a piece of net. This appearance is not seen in ordinary photographs, simply because we do not use the microscope to look at them with; but I have observed it in first-class photographs. I know of no certain remedy for this defect. I have tried chloroform, wood spirit dilution with ether, and other chemicals, but with no certainty of results, and I can find no one who can give any certain cure. You will, of course, ask how I get rid of this structural appearance, as my pictures do not show it. Simply by throwing aside the collodion as soon as it appears, and when I get a good sample, endeavouring to use it before it is spoiled for my purpose. The exciting bath is the ordinary thirty grains solution, with a slightly acid reaction.

All the various developments employed for wet collodion may be made use of. Pyrogallic, with acetic acid, often gives a brown tone to the picture; the salts of iron bring it out rapidly and with considerable brilliancy; but, under a tolerable magnifying power, the result appears granulated like a coarse mezzo-tint. The development which I prefer for blackness of tone, sharpness and uniformity, is composed of two to four grains pyrogallic acid, and one to two grains of citric acid to the ounce of water, with sufficient spirits of wine to ensure even flowing over the plate. The picture comes out slowly, but any amount of blackness may be attained with safety. I fix with a single drop of a strong solution of hipposulphite of soda, and wash well afterwards with filtered water.

We now come to the apparatus employed. The great essential is, of course, the object glass. This is a microscopic object glass, and must be of the very best quality. We shall find it a mere waste of time to endeavour to succeed even tolerably with any glass that is not first-rate as regards its corrections. The focus I prefer is one inch. The angular aperture will be of small importance, except as affecting the quantity of light and consequent time of exposure.

I produced a great number of pictures by using the ordinary microscope, removing the eye-piece and placing the prepared plate upon the stage. This method requires some particular precaution, which I will detail. We must first decide whether we intend to operate by natural or artificial light. If by the latter, we may either place the body of the microscope upright and throw the light down the tube by some kind of reflection, or we may place it horizontally, in which case we must use a clip to hold the glass plate against the stage. The negative to be copied was supported in the first case on the ring of a retort stand, at a certain height above the body, dependant upon the size to which I wished to reduce the picture. In the horizontal position I place the negative in the dark frame of a camera with the lenses removed. In all cases of the use of artificial light care must be taken that the negative is illuminated by parallel rays. I prefer to effect this by using a large condensing lens between the light and the negative. For the natural light we have simply to place the instrument upright upon a table in the open air, in an inclined position, near a window, or in an horizontal position, directing the light by a plane reflecter.

Having gauged the glasses to a uniform thickness, I then take one, coat it with a thick collodion, and sensitize it in the bath in order to obtain a surface for focussing on. After draining the plate, and drying it, I place it on the stage, all things being in position; and by the aid of a hand magnifier, applied sideways, I accurately focus the picture. We must now allow for the difference between the chemical and visual focus of the object glass. Microscopic object glasses are generally over corrected, the violet chemical rays being beyond the visual focus. The glass must therefore be moved a little away from the sensitive surface to get the utmost degree of sharpness. Rules have been laid down for microscopists, in taking enlarged pictures of minute objects, as to the amount of difference between the visual and chemical foci for object glasses of different powers; but the corrections are so variable, and are so much modified by circumstances, that I believe the readiest and surest plan is to ascertain the point by trial till we succeed to our satisfaction. When properly focussed, the instrument must be removed into the dark room, and the prepared plate placed on the stage, the whole wrapped round with a piece of black velvet, and then replaced upon the table in the position before occupied. The velvet being now removed from the top of the tube, the plate is exposed, and must remain so for a space of from five to thirty seconds, according to the density of the negative. If artificial light is used, we need merely turn it down or shade it while we place and remove the plate. It must now be developed and fixed, as usual, the process being examined by a hand magnifier. After drying, it must be mounted in Canada balsam, of which I shall speak presently.

This method of using the microscope is attended with inconveniences innumerable, as the stage becomes stained by the chemicals employed; and if it be a valuable instrument, this method of producing micro-photographs becomes rather costly. I therefore made, in the first instance, a dark frame of brass to hold the slide, and then contrived a special apparatus which could be used for either natural or artificial light. I have thought it best to exhibit the original apparatus, which I still use, as well as one made from the same model by Messrs. Horne and Thornthwaite, who have made arrangements to supply the apparatus. It simply consists of a mahogany board, about three or four feet long, six inches wide, and one inch thick, having two uprights at one end. Between these two uprights a small box slides up and down for adjustment to the centres of different sized negatives. This box is open at back and closed in front, having affixed thereto

a ruder brass fitting, with rack and pinion adjustment; on the axis of the pinion is a graduated micrometer head, with an index, by means of which the exact position of the object glass may be read off for any distance of the negative. The object glass is screwed to the inner end of the brass fitting, and stops of different sizes fit in to the front of the tube. At the back of the box is a fork-shaped piece of brass, in which the dark frame is made to slide into position, or it may drop into a groove as in the ordinary camera. This dark frame is made of brass, the back fastening in with a simple catch, and having openings back and front, which are closed by stops turning on centres. The front one is moved aside in exposing for a picture, and the back one is opened for focussing, which is now performed through the glass. The negative is placed in an ordinary frame, such as is used in dark slides, and this frame is held by means of eccentric buttons, upon a carriage which slides backwards and forwards, according as a larger or smaller picture is required. If natural light is to be used, the apparatus is inclined near a window, so that the whole points towards the sky, as it may be maintained in a horizontal position, and a reflector be used to take the light through the system. A piece of black velvet must be thrown over the box before the plate is exposed, so as to exclude all light but what passes through the object-glass.

For artificial light, I use an argand gas-burner, and make the rays parallel by placing a large lens against the negative. The position of the burner being carefully arranged so as to throw the rays into the aperture of the object-glass, I then focus by means of a piece of finely-ground glass or dried collodion film, placed in the dark frame, and viewed, both apertures being open, by means of a lens. The distance of the chemical focus I ascertain by experiment. When this focus is obtained, I read off the micrometer head, and mark the reading against another mark, showing the exact position of the carriage carrying the negative. I then know the precise position of the object-glass for that particular distance of negative.

I prefer a negative of small intensity, but of course having all the details. With such a negative and a good gas burner, the time will be from ten to sixty seconds. Our picture being obtained and dried, the next point is how to preserve the film from injury. For this end we must use a little microscopic invention. A mounting plate is prepared, consisting of a plate of metal, which may either be supported upon the ring of a retort stand or upon three legs fitted into it. This is placed over the flame of a lamp, and heated till it is warm, but not too hot. The slides are laid on the plate, a minute drop of Canada balsam placed on each, and a carefully cleaned disc of thin microscopic glass, previously warmed, and dropped upon it. The slide is left for a quarter of an hour or longer on the plate to harden the balsam; it is then cooled and cleaned off with a soft cloth.

This is the whole of the *modus operandi*. The apparatus described above, is capable of being used for other purposes. It may be employed for obtaining enlarged pictures of minute objects; the illuminating medium being removed to the opposite end of the system, the object to be copied being placed in the small dark frame and the prepared plate on the sliding carriage. There are also other applications to which I may allude on some future occasion.

ERRATUM.—At page 244, in our last number in the 13th line from the bottom, the word "*backed*" should have been "*baked*."

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—In your *Journal* of the 15th inst., I was not a little surprised to find myself assailed by Mr Thomas Bullock, in regard to the process of taking photographs on leather and cloth, which I discovered. After my process is communicated to Mr. Bullock he says it is the same as his. How can he say that the processes are the same, when we use entirely different materials?

No doubt there is considerable similarity between them, and a person of wit might hit on the one if he knew the other. The friends of Columbus said "It is easy to do that," after they were shown how to make the egg stand on end; but none of them could do it till told *how*.

In reference to this subject, I may mention that there exists a glaring inconsistency between his letter published in the *Journal*, and the last I received from Mr. Bullock, in which he allows the merit of my invention and "sincerely thanks" me for my information, and also for the explanation he desired regarding the newspaper paragraphs he complained of.—I am, Sir, yours respectfully,

W. SMITH.

Tain, Nov. 21st, 1857.

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—Should any of your numerous readers wish to build a glass-house for general photographic use, they may find the following directions of use as to its dimensions and cost. Have the two sides made of wood framing, 14 feet by 7, cut out of 2½ inches by 2 inches stuff, then two cross bars, 7 feet, and one upright, 9 feet, at each end, with a ridge pole, 14 feet, and eight slight rafters will form the whole of the frame, which must be tied with iron work. Two skylights and one side light, each 7 feet 4 inches, will be sufficient, and 36 panes of glass, each 13 by 10, will glaze them. The flooring should be made of one inch stuff, and in three divisions; these will serve to pack the sash-lights should you wish to travel. Four shutters grooved and tongued will form the roof, and if economy is studied, 10s. worth of canvass will cover in the sides, and when well painted will last two or three years. The cost of the whole is about £5 10s. If fitted with door and dark room, with wood shutters complete, about £11. That is what mine has cost, and I find it quite suitable, with Ross's 2¼ and 1⅝ inch lenses, for all purposes. The background I have found most useful is of a dark mouse colour, like the least dark moleskin cloth, and is made of 2½ yards of sheeting; if painted with the following it may be folded closely without injury. Shave one ounce of common yellow soap into six fluid ounces of boiling water, stir till dissolved, add it while hot to one and a-half pounds of "flatting," which can be had from any house painter's; this will dry up without gloss, and form a background suitable for plain or coloured portraits.

I quite agree with "Lillywhite" that uncoloured photographs are the best, but I find that the general taste is just the reverse.

If agreeable, in my next, I will send the result of y experience in the dry processes.—Yours truly,
'isher-st., Swansea, Nov., 1857. T. GULLIVER.

[We shall be glad to hear further from our cor-spondent.—Ed. L. & M. P. J.]

ANSWERS TO CORRESPONDENTS.

Mr. R. Foxall.—In our next number.

Photo.—You will find a recipe for varnish in recent number of this *Journal.* The chloroform sed is expensive.

W. L., Bath.—We cannot at this moment answer itisfactorily your question about a portable tent. /e have not yet seen one to our mind. We shall iake further enquiries. Your single lens covers a ırger space; hence the necessity for a lengthened cposure. The light is concentrated when the ombination is used.

We have not space for several other answers hich we have prepared.

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Printed by the Proprietor, HENRY GREENWOOD, of No. 14, Fairfield Crescent, in the Parish of West Derby, at his Offi 32, Castle Street, Liverpool,—December 1, 1857.

THE LIVERPOOL & MANCHESTER

Photographic Journal,

Edited by THOMAS A. MALONE, F.C.S., Director of the Laboratory in the London Institution, Finsbury Circus, London, E.C.

Published on the 1st and 15th of each Month.

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The

Liverpool & Manchester Photographic Journal.

New Series. No. 24.—DECEMBER 15, 1857.

We are again compelled, from more circumstances than one, to leave over several matters which we had intended to insert this month. The interest which attaches to the chief part of that which we have found room for, will, we trust, be sufficient to reconcile our readers to any disappointment that may arise from our still deferring the other matters we promised to treat of.

M. Pretsch's paper on "Professor Petzval's Researches in Optics," read before the London Society, was listened to with much interest. The chief point of advance made by Professor Petzval seems to be in the obtaining, by means of a comparatively small combination of lenses, a larger picture than usual, shewing equal illumination and a flatness of field, hitherto supposed to be unattainable with an opening of about three inches. The addition of a third lens gives this additional power. The new combination has of course yet to undergo the rigid scrutiny of the English and French opticians. As far as the pictures obtained by the new instrument could tell their own tale, they were admirable. We trust that every point promised us will be fully realized. As yet sufficient data have not been given to the public to enable those versed in such matters to form a reliable critical opinion upon the whole question. We make this remark not in the least by way of disparagement, but simply as expressing the opinion of those who are best capable of dealing with this important subject.

An optical paper, by Mr. Grubb, read at the same meeting, was the cause of some animated discussion,—a general feeling existing that there was some want of agreement in the use of the term, "long chemical range," amongst those who have treated or attempted to treat of the subject. We shall have to recur to this point again. It is probable that comparative experiments will have to be made before all parties to the discussion can be brought to be of one mind as to this matter.

Mr. Buss, at the conclusion of the discussion on the above papers, brought forward the patented photographic lamp, of Mr. Moule. The light produced by the ignition of some chemical mixture in powder was very intense. Portraits taken in a few seconds by this light were exhibited. It is probable that some special arrangements will have to be made ere the light can be used for anything in the way of portraiture, except profiles. The lamp was most perfectly manipulated; no fumes of any sort escaped into the room.

The glass room which we announced as being about to be erected in connexion with the laboratory of the London Institution is nearly completed. As soon as it is habitable we shall give our attention to the positive collodion and other processes of interest. We shall endeavour to clear up some of the discrepancies which seem to exist on various points. With respect to the bath for positives, for example—we have seen pictures produced by M. T. de Mouxy, of the Strand, which are amongst the most beautiful of their class, and which were obtained by means of a bath simply prepared with nitrate of silver, in the solution of which an iodized collodion plate was left merely for a few hours in order to charge the bath with iodide of silver. *No acid* was added. Mr. Keith, by the addition of *much acid*, obtains also very beautiful results. So much for mere formulæ and disputes about their relative values! We wish the chief operators could be induced to give us completely their details of working. They would not lose anything by such liberality. At present, by their secrecy, they check the development of photographic principles much more than if they possessed patents for their processes.

We have not space to-day to do more than allude in passing to a set of transparent stereoscopic slides which have been put into our hands by Mr. Crookes. They are the result of his summer recreation trip into Suffolk. "Suffolk wonders" they have been termed by some of his friends. Certainly his views of the woodland and coast scenery there justify this scarcely hyperbolical speech. There is one particular view of the breaking up of a double wave which appears to us to be the most remarkable picture of the kind yet produced. But our readers must look at these "Suffolk wonders" with their own eyes, or rather stereoscopes.

The editor of *Photographic Notes* shall receive attention in our next. His mistakes and misrepresentations, though mischievously intended, may be safely allowed to circulate for another fortnight: of that we are well assured. Annoyed at our criticisms on his photographic speculations, he has tried to influence our pen. Alas! He did not know how "imbecile" (to return him one of his own phrases) was such an attempt. Having so far failed, he is trying a weapon of an opposite nature, namely, personal abuse, instead of personal flattery! Unless he speedily shows some sense of a better feeling, we shall leave him to that contempt to which Sir David Brewster and others have already consigned him.

We regret that, owing to an accident, the *Journal* has been delayed a day in publication. In our next we purpose giving a Title-page and Index for this year's volume, of which the present is the concluding number.

AMATEURS' COLUMN.

Mr. Talbot's work, "The Pencil of Nature," published in 1844, by Longman and Co., will always be of historical interest to photographers, since it was the first work of any magnitude that was illustrated by actual photographs. We propose to give an outline of the method by which its illustrations were prepared. The negatives, obtained by the calotype or Talbotype process, having been selected, some being waxed and others unwaxed, were copied upon chloride-of-silver paper in the following manner:—Hollingworth's "Whatman's Turkey Mill" paper was taken, by preference, and dipped into salt and water, and left there for about two minutes; the salt being in the proportion of from one to two ounces to a gallon of water, varying with the quality or properties of the sample of paper used; and this variation was carefully attended to. The paper thus prepared was called salted paper. The excess of solution of salt was removed by laying the wet sheet upon a square of glass or a clean deal board, and dabbing its surface with a smooth cloth folded up into a sort of pad. As soon as one surface was freed from the solution the other side was turned up and treated in the same way. The sheets were then dried by leaving them spread out on clean paper in a warm room. It was subsequently found that pressure in an ordinary press, after immersion in the salt and water, was sufficient to remove the excess of liquid; the paper being afterwards dried in any convenient manner. To render this paper sensitive, a solution was prepared called *ammonio-nitrate of silver*, a preparation long known in pharmacy, but, we believe, first applied in photography by Dr. Alfred Taylor, the well-known toxicologist. This was at first made by adding gradually caustic ammonia to a solution of nitrate of silver until the precipitate of oxide of silver which was at first thrown down was re-dissolved. Such a solution, spread upon salted paper and left to dry, gave a more sensitive surface than could be readily obtained by the use of salt and nitrate of silver only; but it was soon found that some uncertainty attended the use of this preparation, the pictures frequently turning out to be "smoky" in appearance, and of a cold, slate-coloured hue. To remedy these defects, Mr. Talbot advised the use of nitric acid, an agent which has lately been recommended by Mr. Hardwich, doubtless without knowing that Mr. Talbot had long ago relied upon it to improve the ordinary ammonio-nitrate solution. One formula was this:—Take of solution of nitrate of silver, of sixty grains to the ounce, any convenient quantity; add to this, solution of ammonia, until the mixture became almost free from the precipitated oxide of silver, the brown colour of which served as a test of its presence. Then render the mixture as clear as possible by the addition of diluted nitric acid. No exact proportions could be relied upon. If the resulting prints were too red, a portion of the acid was neutralized, or the salt varied. If the colour obtained was too cold, more acid was added, and sometimes the nitrate of silver had to be increased to obtain, with certain samples of paper, a good rich velvety "mulberry tint." The action of the nitric acid seemed to be an obscure one. It did not act merely by forming nitrate of ammonia in which oxide of silver is soluble, for a solution of oxide of silver in neutral nitrate of ammonia did not give the same result. And we do not know that it can be said that the process was fully under control; much depended on the sample of paper used. A paper called Nash's paper required no salting, and lately we have seen that Towgood's paper gives a peculiar tone to prints made with the ammonio-nitrate preparation. This subject still needs investigation. The solution was applied by a brush and left to dry spontaneously, using only at last slight warmth to ensure the absence of all moisture. The paper so prepared was generally used the same day, or, if kept, submitted to pressure and partial exclusion from the air by means of a copying frame or press. The prints were chiefly made in sunshine, and printed only a little stronger than the depth required in the finished print. Those over-printed were left longest in *fresh* hyposulphite of soda, or lowered by *immersion in iodide of potassium* and *subsequent exposure to light*. Some fine results were obtained in this latter way. Of course, hyposulphite was used to remove the iodide of silver from the paper. The fixing liquid for these was used hot, and contained one part of hyposulphite of soda to about ten of water. This overdoing and lowering gave a new contrast to the lights and shades. The prints, when removed from the copying frame, were washed in *warm water* to remove the the excess of nitrate and some superficial deposit. The fixing took place in a FRESH solution of hyposulphite of soda, consisting of about one part of a saturated solution of the salt in ten parts of water; this quantity served for about twenty-five prints of seven inches by nine inches; it was then put aside or thrown away. The prints remained about ten minutes in the fixing bath, after which they were washed in only three or four changes of water. The absence of the well-known sweet taste of hyposulphite of silver being taken, *with the consent of high scientific authority*, as indicating a *practical* removal of the fixing liquid. About two or three gallons of water were taken for each batch of twenty-five prints, and the washing pans were arranged in series, so that the prints passed from pan to pan; being finally placed in thick blotting-paper to remove the excess of moisture. The drying took place nearly spontaneously, upon paper placed on shelves in a cupboard in a warm room. Latterly the prints were toned by heat near a fire, or by using a hot iron applied to the paper. Although it was observed that heat alone appeared to modify the colour of the fixed print, it was found that a trace of the fixing liquid was required to give a purple or deep tinge to the finished picture. *Pictures repeatedly washed would not take a deep tone by the action of heat;* and, what is important to observe, pictures so toned have remained good from that time, 1844, till now. We at present believe that they must have contained a trace of the fixing liquid. Experiments *requiring time*, are in progress, with a view of ascertaining how long hyposulphite of soda can remain exposed to the air without oxidation and consequent *destruction*.

M.

MANCHESTER PHOTOGRAPHIC SOCIETY.

The monthly meeting of this Society was held on the 2nd instant, at the house of the Literary and Philosophical Society, 36, George Street, the Rev. W. J. Read presiding.

The Secretary (Mr. S. Cottam) stated that Mr. Mann had presented three photographic pictures to the Society's portfolio, (very beautiful prints from negatives by the oxymel process); and that Mr. Joseph Sidebotham had sent two coloured photographs, which he had done, to try the effect in using them for the magic lantern. In his letter accompanying the photographs, Mr. Sidebotham stated:—"I think, with care, and avoiding too much colour, some beautiful effects may be got in this way; the photographs should be lightly printed and not developed too deeply, otherwise the foliage, which is the great beauty of many pictures, would be lost. The colours I have used are the ordinary colours prepared for oil painting, selecting only the transparent ones. Crimson and yellow lake, gold ochre, burnt sienna, brown pink, Prussian blue, and ivory black will be found to be sufficient. The plan is to put a little of the colours from the tubes on a piece of blotting paper, which soon absorbs the oil; then work them with a medium composed of turpentine six parts, and Canada balsam one part, using camel's hair pencils; and for the sky, on any part where shading is required, nothing appears to answer better than the end of the finger."

A conversation took place respecting the recently announced experiments by Niepce St. Victor, referring to which subject Mr. Mabley stated that having occasion to cover some sensitive paper, it became impressed with the photogenic image of a label on a portfolio which he placed upon it.

Professor Roscoe said that the subject was one which had been long under consideration, and was related to the theory of latent light, as it had been investigated by Möser; it might be enquired whether to other causes than light the effect may be referred.

Mr. Wardley said that gummed labels placed upon prepared plates had had the effect of preventing development on the side opposite to that on which they were placed.

Mr. Pyne stated that some plates prepared under the superintendence of Dr. Hill Norris, had given good results, say in three minutes, with a quarter-inch aperture, six inches focus.

Some remarks ensued respecting the use of rock crystal for lenses, when the Chairman enquired if any one had perceived the effect of stereoscopic pictures taken with lenses less apart than the usual two and a-half inches, which produced an enlarging instead of a solidifying result.

Mr. Nield thought it might be caused by the size of aperture used, large lenses at the usual distance not producing the same effect as smaller ones.

The next meeting will be held on January 6th, when Mr. Mann, who is a very successful operator, will give the Society the benefit of the details of the oxymel process as he practises it. Mr. Neild promised to shew some pictures with the oxy-calcium light at a future meeting.

LONDON PHOTOGRAPHIC SOCIETY.

An ordinary meeting of this Society was held on the 3rd of December, Dr. Percy in the chair. After some routine business, Mr. Paul Pretsch read a paper "*On Prof. Petzval's Researches in Optics:*"—

Mr. Pretsch said, I have the honour to address you concerning some researches in optics of Prof. Petzval, in Vienna, who is known as the originator of the combination of lenses, executed by Voigtlander, Dietzer, and others. The principles of these researches are not contained in any compendious theory. They are the result of careful labour, continued for more than six years, and carried on by several able mathematicians, under the superintendence of Prof. Petzval. The expenses of the work having been paid by His Imperial Highness the Archduke Lewis; the Ministry for Public Instruction and the Imperial Academy of Sciences co-operating. These researches will be published in Prof. Petzval's work, "The Integration of the Linear Differential Equations;" "Die Integration der Linearen Differential Gleichungen."

He begins with investigations for the purpose of finding out the direction of a ray of light, which arrives on a separating surface of two different optic substances supposed to be a surface of rotation. The natural consequence of this is the definition of the path of such a ray through several of such surfaces round the same axis of rotation, and therefore through a certain number of lenses, or mirrors, or mirrors and lenses.

This is a problem partly executed long ago by Euler, De la Cail; and in later times by Gauss, Biot, Schleiermacher, Littrow, Stampfer, Grunert. These researches would in all probability not have been continued, if Daguerre's wonderful invention had not given rise to a demand for a camera obscura more perfect than a mere plaything for the purposes of amusement; the requirements in optical instruments having been hitherto limited to telescopes and microscopes, the only instruments used for scientific purposes. But there is now felt the want of a more perfect instrument for the purpose of fixing on a given surface the transient and immaterial image in the camera.

Hence, therefore, arises the want of large and brilliant images as free as possible from distortion, and correct in perspective, and this want has compelled the mathematician to investigate more intimately the properties of the image formed by lenses of different curvatures. It was necessary to abandon the mode usually adopted in these calculations; it was necessary to develope by a suitable mode in series the co-ordinates of the point in which such a ray passes a surface put on any chosen place;—this series was continued far enough, and the terms of the same were analysed; by this mode he arrived at the imperfections existing in the images, classifying the same in a suitable manner, he originated in this way a peculiar pathology of these optical images.

But these enormous labours have not been undertaken only to benefit the photographic camera. It very seldom, perhaps never, happens that an important extension of our theoretical knowledge does not furnish us with a more or

less fundamental reform of what we already know, and with the improvement in the practical art which is the base of such a theory. Thus an increase of knowledge in optics leads us also to improvements of the telescope and microscope. But these latter improvements might not be approved of immediately by the scientific world. The astronomer might not think it worth while to receive a telescope whose tube is reduced to half its usual length. Nevertheless the new telescopes will gradually replace the old ones, like the achromatic telescopes have now completely replaced the first unwieldy tubes. The same will ultimately happen to the microscope, and Prof. Petzval is convinced that his new photographic lens applied to the solar microscope will, by degrees, perfectly change the views of those who use such an instrument.

The above-mentioned calculations have been continued till the terms of the seventh order inclusive, and we are therefore enabled by the given theory to construct combinations of lenses and mirrors, whose imperfections only belong to the ninth order of quantity. Thus we have arrived in optics and mathematics at the same point as in astronomy, where Burkhardt has continued the development of the functions (of interruptions) till the terms of the seventh order.

This exact definition of the path of a ray of light through a system of surfaces forms the body of Prof. Petzval's researches, and all the other additions make it more practical and furnish the philosopher with new means of research.

With the first approximation of the optic problem, Prof. Petzval was obliged, to his own regret, to represent the four fundamental coefficients of the first approximation, not in the same compact form like Euler and Gauss, but in two other different forms, viz.: for the higher approximation as a series of factors, and for the theory of achromatism as extended algebraic polynomes.

This first approximation with its consequence concerning the properties of light, magnifying power, field of view, and size of picture, with the practical applications on the theory of achromatism of the false light, and of the eye-glasses, &c., will form the first part of his work on optics, to be published by the Academy of Sciences.

Although a great deal has been done in the construction of eye-pieces—see, for instance, the interesting work of Biot in the 19th volume of the "Memoirs of the French Academy,"—and although we possess astronomical and terrestrial eye-pieces, and many others, composed of two, three, or four lenses, we are, nevertheless, not furnished for every case. Prof. Petzval gives several instances to prove this view. He considers all the photographic pictures obtained through the eye-pieces of microscopes inferior to the picture received by the human eye itself by looking through the instrument; because the human eye accommodates itself with a certain elasticity to the eye-piece which possess neither a chemical nor optical focus. For the purpose of obtaining good photographic pictures it is necessary not to change the object-glasses of the microscope, but to use another eye-piece with a different focus, giving a flatter picture.

A second instance occurs in obtaining photographs of the moon. He considers it necessary for this purpose, to obtain at first improved refracting watches; secondly, a new eye-piece; because the image obtained in the focus of the object-glass would be too small, and the picture obtained with the eye-pieces now in use, would not show as much as we see through a good telescope.

A third instance is furnished by the *dialytic* telescopes; they are imperfectly achromatic, possess a limited field of view, and represent a star, only sharp in the centre, showing many aberrations on the edges. This could be obviated by having another eye-piece more fit for the purpose, by means of which we could obtain a large field of view and an even sharp picture, like those obtained with perfect achromatic instruments.

As a fourth instance, Prof. Petzval himself possesses a short telescope for searching for comets, five inches aperture, with a magnifying power about twenty times, and having a terrestrial eye-piece, not Galilæis', neither is it the known one with four lenses, it being only composed of two lenses, so as not to lose light.

It follows from these remarks, that eye-pieces may be looked upon as small tools of science, like files, chisels, screws for the mechanic, and each physicist ought to be able to construct and to choose the one most fit for his special purpose.

The second part of Professor Petzval's researches treats of the theory of illumination. Fresnel only has partially treated of this subject, and our practice is such that the mode at present adopted for the illumination of our streets and public buildings, at night, serves more to illuminate our atmosphere than to enable us to see our terrestrial paths. The instruments for illuminating purposes require to be very varied in form to act with economy in all given cases; rays of light possessing every variety of angle from 0 to 180° have to be properly refracted and conducted to their appointed destination.

Several important facts have been discovered by Professor Petzval in the branch of optics relating to mirrors. He finds, for instance, that every curved mirror receiving light from any source divides the same into two parts; the one he calls the optical part, because it is able to give an image of the source of light, and the other the non-optical part, because it is unable to form an image. The second quality is most especially to be used for illuminating purpose.

Professor Petzval has had much experience in the construction of apparatus for the *distribution* of light. About twelve years ago he was led to devise a plan for illuminating apparatus for the production of dissolving views; and he soon discovered that, by the usual mode, one thirtieth part of the light is really used; but he became able to employ sixty per cent. of the total quantity of light, and he could have rendered seventy-five per cent. effective, if all the small details of his plan had been executed. About the same time he made a plan of an apparatus for the use of river steamers. It wa

so constructed that the points of equal illumination were situated in the periphery of a long ellipse, the ship forming the centre. It was calculated that all objects in a straight distance of 2000 yards, and sideways of 200 yards, were equally illuminated. Nine years later he was requested to construct an apparatus for illuminating places at a distance of 2800 yards, the longest range of the largest shell mortars. There was required for this purpose a large reflector of four feet aperture, ground with great accuracy, and as light as possible, so as to be easily moved; furthermore, there were required lenses of particular combination and of very large dimensions, and it was necessary to construct a peculiar furnace or oven for melting and cooling these lenses. Nevertheless, it is expected that this important work will be finished by the end of this year.

From his researches, Professor Petzval is led to doubt the well-known tale of Archimedes having set on fire the Roman ships of Marcellus in the harbour of Syracuse. Such a fact could only have been obtained at a short distance, and with an apparatus of immense size, and with perfect steadiness on the part of the ships.

It sounds, perhaps, like a paradox, but it is nevertheless true, that, for seeing objects at great distances, we must try to do with as little light as possible. This is one of the few cases where force can do but little, and prudent economy all.

Professor Petzval considers the theory of *illuminating* sufficiently developed and based on principles, but this is not the case with regard to the art of *producing* light. There is a certain relation between heat and light which is not yet sufficiently explained. To prove how much the power of light depends upon heat, Professor Petzval made a fundamental experiment with a lamp which had three concentric wicks. After having well regulated the three flames, placed one in the other, the light appears thin and transparent, and of a wonderfully white-blue colour, each flame being visible through the other one. But, if the flame in the centre is put out, we observe directly that the other two flames lose brightness—that they become poorer in light, less transparent, and longer or higher. If, in the same way, we put out the middle one, keeping only the exterior flame alight, then we observe that this last flame has lost all its lustre; it appears yellow, and not at all transparent. The great heat and supply of oxygen causing less carbon to be separated in the flame, the light is given of a transparent character, but then those particles which are separated are more intensely heated, and thus glow with increased brilliancy; thus the light is brighter, though less solid. Experiments of this class should be continued with gas lights. To illuminate economically a street it would be better to use one large light with twenty-five distributors, instead of using twenty-five lights. It is not at all improbable that the time will come when, in every capital of Europe, and even, perhaps, in smaller towns, there will be erected a building of a dome shape, and an immense height, crowned with a transparent pavilion, containing a gigantic flame, which would send to all the neighbourhood a much richer and more equal light than our present system of illuminating by an immense number of small points of light.

It is very probable that Drummond's light and the electric light surpasses the intensity of the sun-light—that is to say, that a square inch of the white-hot chalk surface sends out more light than a square inch of the surface of the sun himself.

The researches of Professor Petzval, of which the above statements furnish but a slight idea, will be published after the second volume of the "Integration of the Linear Differential Equations."

In conclusion, Mr. Pretsch said:—

Having mentioned so many interesting facts, I feel it is almost too much demanded from your patience to wait till this work is published. It will be easily imagined that the practical execution of all these proposed improvements would require an immense deal of labour, time, and capital, and the co-operation of many scientific and practical men. However, I can show you at least a few specimens, executed by an instrument which originated from a part of these investigations and researches. I have the honour to place before this Society some photographic pictures taken with the lens and camera obscura, calculated and invented by Prof. Petzval, and executed by Mr. Charles Dietzler, optician in Vienna. These pictures are not very remarkable as photographs; you have seen far better ones, but they show the peculiarity and quality of the instrument.

Here is a picture of the apparatus itself. The camera consists of two parts, or two bellows, a larger one, and a smaller one; on the last is the lens, consisting of six glasses, three of flint and three of crown. The ground glass is twenty inches square, and arranged that it can be moved out of the perpendicular, if required. The camera is movable on a prism, by means of a coarse screw. Having obtained the required length of the camera, the exact focal adjustment is obtained by means of a fine screw near the ground glass. The lens is three inches aperture, and gives sharp pictures of sixteen and more inches. The focal length is twenty-six inches; time of exposure, viz., for a landscape, in good light, three seconds; a group of figures, in the open air, fourteen seconds; in a room forty seconds. These are the particulars given to me, and I do not doubt they are true.

Here is the copy of a map taken by this lens with a stop or diaphragm. You will find it sharp in all its parts, and I think this picture proves the applicability of the instrument for maps in general, as well as for copying drawings, prints, and paintings. Especially I should like to have this instrument tried in copying paintings, because I consider this branch of photography a very important one, and I do not consider this problem at all satisfactorily solved at present. If my expectations of this instrument are proved to be correct, I think the productions of it would give a new impulse to the applications of my method, "Photogalvanography."

There is a view of the "Burgplatz," in Vienna, an oblong square of about 300 feet in

length. The colossal monument stands in the centre of it, and the point from which it was taken, is the same distance from the monument as that is from the background. You see by the dial of the clock that the time of exposure has been very short. Every part of the picture is equally sharp, and the lines and perspective correct. I consider that this picture as it is, could not have been taken by *any* other instrument.

Here are two pictures of architecture; they are no doubt very good, but they could have been taken by another lens; if we have light enough, time enough for exposure, and a suitable distance, then almost any instrument will serve for the purpose, perhaps even a little hole in the camera with no lens. But practical photographers know very well that these requirements are very seldom to be had, and there are some cases where a picture can only be obtained during a few weeks of the best season of the year.

The last picture which I have the honour to show you, is inferior as a photograph, because it is taken by the optician himself, representing him amongst his apparatus. But it shows most of the peculiarities of the lens. You know perfectly well that each picture in a camera, especially when formed by a combined portrait lens, exists only in a curve, therefore the corners and edges cannot be as sharp as the centre, and the light is mostly concentrated in the middle, and so the photographer is obliged to place the most important part of the picture in the centre (generally the head of the person to be taken), and his skill and experience teaches him just to catch the picture when the lights are not too much overdone, and when the shadows just begin to appear. These difficulties seems in this picture to be perfectly obviated; the light is distributed over the whole surface, and the picture is equally sharp at the edges and corners as in the centre. I have here two copies, one mounted and another unmounted. I recommend them to your special examination.

And now perhaps you will ask me where this instrument is to be had. I am unable to give you a sufficient answer. I have already written to the manufacturer, with whom I am personally acquainted, for some of these apparatus, but he hesitates to make them public before he has taken steps to secure himself the advantage of at least the first sale. However, I hope in a short time to receive the terms and particulars under which they can be obtained, and then I shall be very glad to make them known to any person desiring the same.

Before discussing M. Pretsch's paper, it was agreed that the following paper, by Mr. Grubb, M.R.I.A., "*On some of the Optical Principles involved in the construction of Photographic Lenses*," be read:—

Understanding there is a general feeling that the optical and physical sections of the art (or science) of photography are not as adequately represented in communications to your Society, or its *Journal*, as are the other sections of the art, I purpose to (at least in some measure) restore the balance by an occasional contribution of a paper coming under the head of the optics of photography.

That the present is not my first essay in the same direction, will be recollected by some of your members; and, having recently glanced over the discussion, as published in your *Journal*, on huge *versus* small view-lenses, it appears desirable for me to make a few final observations on the same previous to entering upon a new subject.

It is now just two-and-a-half years since "C. J. F." (following in Mr. Sutton's wake) informed the Society that he had practically ascertained the fitness of the smaller lens, by getting one made of one-and-a-half inch diameter and fifteen inches focus, which gave very perfect definition up to the edges of a field of nine by seven inches. "C. J. F.," however, has given no information as to the aperture of the stop used in producing such result; and as the indistinctness arising from aberration is as the third power (or cube) of the aperture used, so almost any desirable distinctness of outline can be obtained with the worst lens, provided only that the aperture be sufficiently reduced; for example, I have seen a very fair photograph which had been taken with an ordinary single lens costing half-a-crown. "C. J. F.," however, appears to have mistaken the question which I, at least, was discussing, viz., the size which a view-lens should be for a given focus and field, in order to afford *the best result*, and which I consider to include the conditions of the utmost distinctness throughout the field, when using a diaphragm or "stop," of the largest possible aperture, which other circumstances admit of.

In respect of the specious argument advanced first by Mr. Sutton, and reiterated by "C. J. F.," viz., that *that* construction which is best suited to the case of a view-lens of the larger aperture is not necessarily the best in the case of the smaller; and, therefore, that the experiment which I originally proposed for ascertaining the least best aperture was not applicable (or conclusive), I would here observe that, if any one competent to the matter will only make a diagram of an ordinary view-lens, and examine the passage of a pencil (central or lateral) as it occurs in practice, through the lens, he will find, that of the four surfaces of the compound, the difference (for either the large or small construction) is *nothing* for the first, second, and third surfaces, and for the fourth surface so little as not materially to affect the general result; and, consequently, I assert that the experiment, as originally proposed by me, is *conclusive*. "C. J. F.'s" assertion that all it (the experiment) proves is, that the outside of the picture is produced by the outside of the lens, is simply absurd.

Lastly, I would observe, that two-and-a-half years having now elapsed ("C. J. F.'s" paper is dated May 5, 1855), and view-lenses being still, with few exceptions, made and used of the larger aperture, we can scarce help coming to the conclusion, independently of my arguments, either that "C. J. F.'s" partiality to the smaller lens has been misplaced, or that opticians are a sadly incorrigible class, or photographers a very soft one, to purchase and carry lenses of twice the diameter, four times the price, and eight times the weight necessary.

As a postscript (and lest silence should be construed into assent), I desire to state that I have not found the *radius of curvature of a field*, given by a plano-convex lens (plane side next parallel rays) to be equal to focus + radius of convex side, as Mr. Sutton said I would.

The subject which I propose to discuss on the present occasion has been selected more for reason of its importance, than probable interest. If (as I apprehend) error is being disseminated and acted upon by photographers, the sooner that more correct views are arrived at, the better.

It will be necessary, as I proceed, to speak occasionally of "*angular aperture*;" and, to avoid digressions, I would beg here to remind those who pay little, or only occasional attention to such matters, that while "aperture" (of a lens) means simply its effective or exposed diameter —"*angular aperture*" is the diameter, taken in connexion with its focal length. Thus we may have lenses single or compounded of various sizes, and all of the same angular aperture; and, conversely, we may have several lenses of the one actual aperture or diameter, but of various angular apertures (provided their foci differ). It is important to photographers to have a clear conception of angular aperture, as with it varies the intensity of the chemical, as well as visual images, this intensity being as the square of the angular aperture.

[On account of the length of Mr. Pretsch's and Mr. Grubb's papers, we are compelled to omit a large portion of the latter, and also the discussion which took place upon both of them, till the publication of our next number, when we intend giving a diagram in illustration of the remarks of the latter gentleman.]

DIRECT POSITIVES ON COLLODION,

By F. Hardwich, Esq.

(Concluded from page 251.)

"A comparison was next made of photographic properties, the one-and-a-half grain collodion being used in every case.

"1st. *Sensitiveness.*—Here the difference was not very marked, perhaps the twenty-grain solution had a little the advantage; at all events it was plain that nothing had been lost in this respect by diminishing the proportion of nitrate.

"2nd. *Clearness of Image.*—In every case the image was perfectly clear, in the sense that there was no *fogging* or reduction of metallic silver on the transparent parts, but there was a difference in the appearance of the "*lights*;" when baths A and B were employed, they were always slightly obscured, especially the shirt and forehead of the sitter, by a yellowish deposit of silver, which seemed as if it had been precipitated after the proper development was complete. I conclude that this deposit was derived from the free nitrate of silver on the surface of the film, which being in a more concentrated state in the two former cases, was the more readily acted upon by the developing fluid; however, it may not be that the effect here alluded to will invariably follow when a neutral bath so strong as forty grains to the ounce is used; much depends no doubt upon the nature of the developing agent; indeed the two must be associated together, the strength of one varying inversely with that of the other.

"The conclusions arrived at are these, that with the dilute iodized collodion, nitrate of silver in the proportion of twenty grains to the ounce, gives equal sensibility, and in every respect the same perfection of image, as when used of greater strength; besides this, it has the merit of economy, and superior cleanliness of manipulation; if the proper precautions are observed, such a bath will remain constant in its action for a length of time.

"Before proceeding to the developing fluid, there yet remains to be considered, as originally proposed, the effect of adding nitric acid in graduated quantities to the neutral nitrate bath; my experiments in this direction are, I am sorry to say, as yet incomplete; however, two or three facts of importance are manifest, viz: that it is impossible to lay down any general rule as to what the effect of adding the acid will be unless we take into account all the other circumstances of the case; no doubt there will invariably be a loss of *sensitiveness*, but whether or no advantages will be gained in other respects, seems to depend upon further considerations. When collodion positives are taken by solutions modified as I have proposed, it will be found that the smallest amount of free acid, even such as cannot at once be detected by test paper, will sadly injure the 'half-tones' of the picture.

"On the other hand, many photographers advocate the use of nitric acid, and state that they obtain a better result by means of it.

"In explanation of this seeming discrepancy I would suggest (and the views I entertain are borne out by my experiments as far as they have gone), that the amount of free nitric acid which may be added to the bath with impunity depends mainly upon the *strength* of the solution of nitrate of silver; strength of bath is favourable to reduction, nitric acid is opposed to it, consequently the two, to a certain extent, balance each other. But besides this, I am inclined to think that *something depends upon the thickness of the film of iodide of silver*; perhaps it may be that the particles of iodide being less in number are more easily attacked; but, at all events, it seems necessary to regulate the acid, both in the bath and in the developing fluid, with greater care when weak films are employed than under contrary conditions.

"It is important then, and indeed essential, that the dilute nitrate bath should be preserved accurately neutral; this may easily be effected by adding a little carbonate of soda and so setting free carbonate of silver, which can be allowed to remain continually at the bottom of the bottle in which the bath is kept; if however iodide of *ammonium* is used in the collodion, this plan does not succeed, because nitrate of ammonia, which will then be formed in the bath, has the property of dissolving carbonate of silver, and forming with it an alkaline solution; in that case it is better to keep a piece of blue litmus paper always in the solution of nitrate and when the colour is perceived to be changed by the small amount of acid liberated by the free iodine in the collodion, to add ammonia graduated to fortieths of a minim until the evil is removed.

"Having now finished what I have to say on the subject of the nitrate bath, it only remains that I should speak of the *Development* of collodion positives in order to complete my paper. The deposits which constitute the light portion of these pictures consist in all cases, excepting where the bichloride of mercury is used, of metallic silver; but it may be useful to class them under two heads, according as they do or do not possess metallic lustre.

"The first is a surface bright and sparkling, like frosted silver, very white when produced in perfection, but with occasionally a greyish or tinfoil hue.

"The second is dull and without lustre, of a whitish tint, slightly inclined to yellow or grey; there is no appearance of metal about it, the colour being more like that of a piece of chalk.

"These two varieties require exactly opposite conditions of developing fluid to produce them; from what I can gather from my own experiments, and from the observations of others, it would seem that the first is obtained by means of a reducing agent checked, as it were, in its action by the presence of a strong acid, consequently the development proceeds slowly and gradually, and the particles of silver are large and crystalline; on the other hand, the second variety results when the action of the developer is sudden and violent, no impediment being offered by the presence of acid, except in minute quantity. The particles of metallic silver are here smaller than before, and being comparatively amorphous, they reflect light in a different manner. The distinction in the two cases, then, if the views here given are correct, lies in the amount and strength of the acid used; in the one it is simply sufficient to whiten the picture slightly by preventing the precipitation of oxide; in the other, being increased in quantity, it tends to retard the development as well. In conducting these experiments the action of several different developing agents was compared, viz.: pyrogallic acid, the same with subsequent whitening by bichloride of mercury, protonitrate of iron, and protosulphate of iron.

"1st. *Pyrogallic Acid.* — This gives, under certain circumstances, a beautifully white deposit of silver, free from lustre; it should be used in the proportion of three grains to the ounce, with a small quantity of nitric acid; if too much of this substance be added, the deposit is more metallic, but the half-tones are not properly brought out, so that the pyrogallic acid is not adapted to produce what I have termed the first variety; so also it does not succeed when the proportion of nitrate of silver in the bath is reduced to twenty grains to the ounce; in that case the development becomes imperfect in parts of the plate, and large patches of a blue or greenish colour are seen.

"2nd. *Pyrogallic acid and acetic, with subsequent whitening by bichloride of mercury.*—I was unsuccessful in my attempts to produce good pictures by this plan; the colour of the image was not sufficiently white, but had invariably a bluish tint, which was particularly unpleasant: other photographers, I am aware, have produced excellent results with bichloride of mercury, and it may be that the extreme tenuity of the film I employed was one cause of the blueness and transparency. Another objection appeared to be that the details of the picture were slightly injured by the action of the bichloride, and the whole image reduced to a certain extent in intensity; this was more apparent after blackening by means of ammonia, and then again whitening a second time.

"3rd. *Protonitrate of iron.*—This substance is peculiar in producing an image of brilliant metallic lustre, without the addition of any free acid, hence it may at first sight seem to be an exception to the observations that have just been made on this subject; it is remarkable, however, that protonitrate of iron should be so feeble a reducing agent when compared with the corresponding sulphate; probably the reason may be, that in passing into the state of *persalt*, a portion of the oxygen required is furnished by the decomposition of the nitric acid itself, and hence less would be extracted from other sources. In experimenting with protonitrate of iron, I found a difficulty sometimes in bringing out the half-tones of the picture properly; to obviate this, it is advisable to use the solution of the salt in as concentrated a state as it can be procured, and to increase the proportion of nitrate of silver in the bath, if required, from thirty-five to forty grains to the ounce.

"With the dilute nitrate bath of twenty grains to the ounce, protonitrate of iron failed entirely to develop the image, thus affording most conclusive proof of the close relation which the strength of the bath bears to the energy of the development.

"4th. *Protosulphate of iron.*—This salt appears better adapted for the purpose than either of the others when the twenty grain bath is employed. In order to obtain the tint which has been characterized as a dead white with absence of lustre; it must be used of such a strength that the picture comes out almost instantaneously in all its details; it occurred to me at first that the gradation of tone would be injured somewhat by this violent method of proceeding, but I do not find on trial that such is the case; neither is there any indication of fogging or over development if the solution be poured off from the plate tolerably quick.

"The proportions I have been in the habit of using are these:—

Protosulphate of iron *pure*, gr. 15 to 18 or 20.
Acetic acid (glacial) minims viij.
Distilled water one ounce.

"In the place of the acetic acid, strong sulphuric acid minim half, or nitric acid minim quarter, with fifteen drops of alcohol may be used; the alcohol certainly has the effect, as has been stated, of causing the solution to flow more evenly, but it appeared to me, that if present in too large quantity, the liability to 'specks' and 'dirty marks' was increased.

"If the solution of protosulphate is in too concentrated a state, it will be difficult to pour it on the plate sufficiently quick to cover the whole surface before the action begins; in such a case, after fixing with the cyanide, curved lines will be seen, such as would be produced by a wave of fluid flowing forwards and resting for an instant at a particular spot.

"On the other hand, if the solution is too

dilute, the image becomes slightly grey and metallic on drying.

"For fixing the picture by removal of the unaltered iodide of silver, cyanide of potassium* appears preferable to the hyposulphite of soda; it may be used of such a strength as will clear the plate gradually in about half a minute or so, and is easily washed away by pouring a stream over the plate for a short time.

"For 'backing up,' I employ two varnishes, both of which dry speedily; the solvent is different in the two cases, and that of the black japan does not appear to act upon the transparent layer beneath. A complaint is sometimes made that collodion positives do not show to advantage through the glass, but I have not myself been able to distinguish at all between the two sides, excepting in cases where the picture was slightly over-exposed.

"With regard to the time required for taking a portrait on a tolerably bright day, as giving some indication of what the degree of sensitiveness of the plates might be, I would say that with a Ross' portrait lens of two-and-a-quarter inches, having a diaphragm of an inch and three quarters aperture, an exposure in the camera of two to three seconds is the average; when distant objects are taken with the full aperture of the lens, it is hardly possible to remove and replace the cap sufficiently quickly."—*Jour. Photo. Soc.*

THE PREPARATION AND PROPERTIES OF GUN COTTON.

By Alfred Deane, Esq.†

Of all the photographic processes, none for simplicity, quickness, general application, and artistic effects has equalled the use of collodion, the foundation of which is gun cotton; a preparation that was once anticipated to be the grand agent of destructive warfare, and which is now a great promoter of friendship, peace, and the fine arts, and helps to work such miracles of quick and accurate drawing, as to be, in its application, a wonder of this wonderful age—second to none.

When first commencing with photography the importance of gun cotton was such, in my estimation, that a month's experiments were not thought too long to devote to the subject. I learned that it can be made from any materials containing woody fibre—whether leaves, grass, wood, rags, potatoes, ropes, &c., but that cotton as presenting the fibre in its purest form and finest state of shreds, was the most eligible material with which nature has furnished us. I have tried animal wool and other substances, but, with the exception of wash leather, without any desirable result.

First, procure the cotton as clean as possible, and then boil it in a strong solution of potash or soda, if somewhat caustic the better, or stir it well in some hot alkaline liquid, so that it may be freed from a natural oil it contains, which causes an unequal action in the after process.

Now procure an ordinary pickling jar, of any size, and if the top is flat, or rubbed flat on a stone, so as to allow a piece of ground glass to lie evenly on its surface, to prevent the too easy escape of the fumes, so much the better.

Mix by degrees in a stoppered bottle an equal quantity, by measure, of commercial sulphuric and nitric acid, sold at about ten pence per pound; though not quite pure, it answers as well, and often better, being generally stronger, than the purer and more expensive kinds. When this cools, pour into the jar filled with cotton sufficient of the nitro-sulphuric acid to give it equal dampness to prevent an unequal action in the after process.

The sulphuric acid of commerce can be generally bought strong enough for our purpose, but nitric acid varies so much in strength, and is mostly so weak, that I have found it best to make it from nitrate of potash, by adding by degrees the pounded salt to sulphuric acid. The mixture should be made in a stoppered bottle, and shaken leisurely, so as to prevent it heating too much. No weighing or measuring is required, as it will be right if it is all fluid, at about 200 degrees temperature, or fluid enough to flow out of the bottle at half that heat. It will be quite solid when cool. No action worth considering takes place with the cotton in this strong acid when cool, or even warm; and here comes my grand secret—commence with the materials as cool as possible, then you may so apply heat that you command the progress at pleasure.

Warm the solid sulphate of potash just enough to allow it to flow out of the bottle into the jar of cotton, which, on well stirring with the mixed acids, becomes more fluid. Now place the jar covered with a piece of glass on a hob, sufficiently large to command different degrees of temperature, or place the jar in a pan half full of warm water or sand, over the fire, and in the course of several minutes, just before the heat is at the boiling point, or at the boiling point if no solution is taking place, take it off. Quickly draw it out with a hooked wire or glass into a large pan of water, immediately stirring to prevent solution taking place in the inner part of the clotted cotton, by the weakening of the acids.

With weak acids it is well to allow the heat to be high, though in them the cotton is most liable to dissolve, and once properly commenced the internal heat becomes so great that all the cotton disappears before you have time to draw it out into the water.

The great advantage of using the heat of a fire, is in being able to regulate it, while the fumes go up the chimney. In a glass vessel you can watch the behaviour of the cotton, and may consider it satisfactory if none of it dissolves. The redness of the fumes inside the bottle will soon become a good guide to the change the cotton is undergoing.

A little experience will soon indicate to the novice the strength or weakness of his acids, for, if weak, the cotton is disposed to dissolve at a proportionately low temperature, while if strong, the heat may reach safely 212°. Or the stronger the acids, the less heat required, and the greater the heat the cotton will bear the quicker the action.

* Cyanide, as *pure* as can be obtained economically.—Ed. L. & M. P. J.

† Read at the meeting of the Chorlton Photographic Society, November 12th, 1858.

The beginner, should he suspect the weakness of his sulphuric acid, would do well to stop the action before it advances too far, and hook out a tuft of cotton into some water; and if it is unaltered in strength, it may be considered underdone; if it feels of a much greater specific gravity when washed, and is much more tender, it may be considered right; and if it falls away in the water, in rotten short threads, the cotton may be good, but it is dissolving from being over done. When first learning, I would take a piece of cotton out of the wide-mouthed bottle; roughly wash and quickly dry, first by squeezing in blotting paper, and then open it out and place it near the fire, and treat in the following manner:—Place a tuft, quite dry, on a clean bit of glass or white porcelain; apply a flame, and if it burn slowly with much flame, and little or no explosion, leaving a black tinder, make sure, if the acids are strong enough, that more heat or more time is required. If the tuft slightly flames and suddenly explodes without much noise, leaving behind a little black ash, and especially a little damp, gummy residue, it may be considered satisfactory. If it suddenly and somewhat loudly explodes, leaving behind a dry white powder, it must be considered over done, not probably because the acids were too strong, for of that there is little fear, but because the heat was too long, or high, or both.

For the most certain test it may be as well to keep at hand one or two ounces of known quality of æther, and alcohol mixed in equal proportions. In this the cotton should readily dissolve, an inferior quality requiring a larger proportion of æther.

Put about a grain of cotton to a dram of the fluid, and if it does not dissolve or only partially, and remains little altered in strength of fibre, it is underdone, but if it appears to be dusty it is overdone. If the cotton is disposed to make the whole fluid into a jelly whilst dissolving, a few drops of ether alone added, may cause it to liquify perfectly, but still this cotton will not dissolve at the rate of more than three or four grains to the ounce; but, if made at a higher temperature, it would then become perfectly liquid in the test mixture.

A good cotton will, in dissolving, instantly become transparent, appearing for a moment like dissolving gum arabic, and soon becomes perfectly lost in the solvent, at a rate of eight grains to the ounce, and will even bear from four to six grains to the ounce, if three parts alcohol to one of æther is used.

This is the only cotton on which you can expect to get rich and brilliant-toned positives, as it has less of the cotton in its nature; for my notion of the cotton is, that in solution it is merely a neutral medium for the formation of the iodide of silver, and receiving the reduced salt, while the underdone cotton has a tendency to unite with a more unreduced or oxide of silver.

This very soluble cotton may be for colour of deposit no better for negatives, but as it is most free from network on drying, will bear the most alcohol, therefore less liable to tear off the glass, and is more porous, and therefore rougher and more sensitive. It must be the rule to get a cotton that will bear the most alcohol. Views or portraits on a rough porous alcoholic collodion, are bolder, softer, and more artistic. Should your cotton only partially dissolve, it shows that you have been too quick in your manipulation, not using the glass rod enough in stirring. I am not prepared to give any clear theory of the chemical change the cotton undergoes, but will certainly deny that there are any definite kinds of gun-cotton, for the cotton is capable of all degrees of change, from it being little altered to a more or less soluble cotton, until it goes on to the insoluble explosive gun-cotton, just as you may more or less alter cotton by heat until, from being a little burned, it becomes perfect carbon.

With respect to the use of linen or paper, I have found no advantage over unrepelling or washed cotton, especially if that cotton is cut with the scissors in short lengths, as paper merely undergoes a process that makes its fibres shorter, and thus presents more open ends to allow the acid to get inside the cotton or fibre, but it has this disadvantage, that the outside of the fibre is more pressed over-lapped, or intertwined, and less exposed to action. The cotton, after being roughly washed in water, requires nothing more than being well squeezed in many changes of warm water, dried and bottled.

In making collodion, I seldom use less than seven grains of cotton to the ounce, and reject, for good reasons, methylated æthers. A good collodion, can be made from two to sixteen grains of cotton to the ounce, and containing from three to eight grains of an iodine salt, while a developer may be used successfully from two to twenty grains of protosulphate of iron, according to circumstances, and the other materials used.

Having tried all kinds of additions to collodion, such as iodide of silver, essential oils, chloroform, &c., I can only say that they are best let alone, with the exception of iodine, which sometimes tends to unite with and throw down invisible impurities in a new collodion, and therefore doing more good than harm, if not used in excess. One-fifth of a bromide is good for the better taking of certain colours.

The opacity of the film after it comes out of the bath, is no certain guide of the strength of the collodion in iodides, for a porous collodion, with the same quantity of an iodine salt, will give a more creamy film than a close textured one, simply because the particles of iodide of silver were formed slower, and, if I may be allowed to say, in a finer state of division, at least so arranged as to appear more transparent. A little water added to a very anhydrous collodion will often make a somewhat transparent film look more opaque, as the collodion has become of a more porous quality.

Again, make an iodide of silver in a strong or weak solution of nitrate of silver, and the result is, a strong solution precipitates snowy flakes, a weak one a fine milky deposit, so that by a weak or strong bath, a porous or impenetrable film, the action is slower or quicker, and will give different opacities with the same quantity of an iodine salt in the collodion, independent of the different thicknesses of the film.

CORRESPONDENCE.

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—During the past summer I have employed some of my spare time in testing the utility of the various dry collodion processes that have lately been brought before photographers. My first trial was of Long's gelatine process, and in several instances I was quite successful, and should have continued it but for one thing, and that was the great difficulty of keeping the film on the plate; so, after repeated trials, that process was entirely given up. The next attempt was with the collodio-albumen process, as used by Mr. Ackland. In that I was much more successful; the film seemed rivetted to the glass, and required some exertion to remove it when a failure occurred; but then it brought with it the usual disadvantages, blisters, stains, &c., and required much care and trouble to secure even moderate success, with one whose principal time was occupied with "face mapping," as Mr. Ross calls it. So, finding the result not equal to my expectation, that process was put aside. The next and last was the oxymel process, as now used by Mr. Llewellyn. In that I have succeeded beyond my expectations. The slight trouble required and *certainty* of having, even under the most unfavourable circumstances, a pretty good negative, should recommend it to all photographers. Any good negative collodion and bath will do, but I have been most successful with Horne & Co.'s usual negative collodion, used in the following manner:—coat the plate as usual, allow the film to set twenty or thirty seconds, immerse in the bath three minutes, allow it to drain one minute, pour on two drachms of the syrup at one corner of the plate, let it flow slowly to the opposite corner, then pour on and off half an ounce or so four or five times, let the plate drain on blotting paper a short time, and it is then ready for the camera. I prepared a plate thus over night, exposed it next day, using Horne & Co.'s stereoscopic lens, two minutes without sunshine, developed it the same evening, and obtained a perfect negative. Should the plates be intended for longer keeping, they should, when taken from the sensitive bath, be slightly washed in two waters, they will then keep five or six days, but require much longer exposure, say five minutes in bright light, and ten or twelve in dull weather.

Errata.—In the varnish for preparing positives for colouring, for twenty-three drachms read *two ounces;* and in the directions for constructing a glass house, for least dark moleskin, read *best* dark moleskin.—Yours truly, THOS. GULLIVER.
Fisher Street, Swansea.

P.S.—Developing boxes and tents in my next.

To the Editor of the Liverpool and Manchester Photographic Journal.

DEAR SIR,—I have much pleasure in sending you, for your *Journal*, a report (an abstract) of my remarks made at our July meeting, containing my plans for the production of such a photograph, on porcelain, glass, enamel, and all the allied materials, as shall give a good *dark* photograph, and a photograph so intimately amalgamated with the porcelain or glass as to partake of its imperishability.*

You will find by the report I send that I was not guilty, as by your remarks in your leader you seemed to suppose, of the absurdity of claiming, as any discovery of mine, the well known facts of the change of colour produced on oxides by heat, but that, on the contrary, I directed the attention of photographers to the experience and practice of glass and porcelain stainers, as furnishing half of the foundation of the edifice which it was my design to shew them how to build up. I have no hesitation, however, in claiming to be the first who has directed attention to this change, in connexion with burnt-in photography; as *indicating*, and unmistakably too, in what direction we had to look for help out of the difficulties which had hitherto baulked our progress towards a really valuable *burnt-in* photography. More I did not claim than the announcement of this clue, and *the showing to the Society, the results* of much chemical study, *and exceedingly varied experiment during the last three years;* and a variety of photographs (with the descriptions of the methods of producing them and others) containing the materials suitable for a burnt-in photography (on the principle which I had recommended), giving them thus all the different links in the chain, so that it remained only for an ordinary workman, provided with the proper tools, to put them together. * * If I recollect rightly there were some remarks in your leader which seemed to imply that you had taken some observations of mine as intended to disparage your previous labours on porcelain and glass. Nothing could be farther from my intention, and for two reasons: Firstly, that I did not then happen to be aware of your productions on porcelain, though I now am, by reference to Mr. Hunt's book; besides our discoveries do not clash. Secondly, that I have long appreciated the value of your photographic labours. [Here follow some complimentary phrases, for which we thank Mr. Burnett, who goes on to say that he is no "payer of compliments," but wishes to give a mark of his "consideration and respect" for the Liverpool Photographic Society, and for this *Journal.* Mr. Burnett, in conclusion, pleasantly observes that he believes we shall appreciate his simple expression of consideration far more than we should "a whole *forest* of high flown compliments" in praise of ourselves, especially if they were given in the style of one of our Liverpool friends, as exhibited in his correspondence with the Editor of *Photographic Notes.*]

Mr. Burnett signs himself,

Yours very truly,
CHARLES J. BURNETT.

[In a *Postscript*, Mr. Burnett adds, after referring to Mr. Forrest's alleged claims, "I have just seen Mr. Sutton's last. He tries very hard to be very severe on you, and comes out himself as an admirer of *albuminized* positives. I thought they had been 'vulgar.'" Mr. Burnett then goes on to detail his experience as a contributor to the columns of a contemporary, who has gone out of his way to attack us on points in which he is himself sufficiently vulnerable—that of printing matters which have already appeared elsewhere, &c.; but let us hear Mr. Burnett's experience: "Mr. Sutton tried his puffing system first with me, but found *it would not pay* I would neither make a return in kind, nor would I, giving up my opinion, defer to his judgment on points when I knew him to be talking 'sheer rubbish.' I refused, in return for his patronage and pattings on the head, to divert my energies from useful research, to the filling of windbags for the supply of his *gigantic windmill*, the *Notes!* and I had actually the unadvised rashness of questioning our *dominie's* 'infalibility,' and to expostulate with him about the distribution of his condemnatory and laudatory criticisms, and to threaten that unless he showed more rational discrimination, *as to both*, that I would go over to the enemy—(for whom Mr. S. has no very polite designation). Immediately after this comes his reply, *beseeching* me not to deprive him of my valuable support in the unequal strife, and detailing the difficulties and 'up-hill' nature of his 'labour,' and in the very next *Notes* appears an

* The notes appended to Mr. Burnett's paper report, as printed in our last, render parts of this letter unnecessary.—ED. L. & M. P. J.

announcement that the excess of their flourishing would compel him to bring out a weekly athenæum. Then, as a return to show his gratitude for my sending him more articles, instead of giving them to you as I had threatened, he keeps them for months, bringing them out at last, bit by bit, mangled and garbled, so as to be scarcely recognizable by the writer, and in many places either utterly unintelligible, or saying the very opposite of what I had said. I was inclined at first to blame his compositor for this, but the extraordinary knack of making one say *exactly the opposite* of what one has said, coupled with Mr. Sutton's objections to give one the chance of correcting the proof, and his extraordinary misrepresentations of my statements (when our opinions have come into collision) of even what he has printed correctly, raise strong suspicions that Mr. Sutton's eccentricities in proof correction, have fully as much to do as any fault of the compositor with the 'inattentive composition.' Apropos of inattentive composition, I send you a copy of the pamphlet alluded to in my July remarks, and published early last spring or summer. You will find that even in *this* which was *sent in print*, he has managed to make more than one blunder in the reprinting. Apropos also of his 'twitting' you with republication and 'abstractions,' this pamphlet was sent to him and reprinted without the slightest acknowledgment to the public of its being a *reprint*, and without the permission which any one else would have asked for reprinting an entire pamphlet, and though I did not mind this much, it struck me as a little cool.

"You will find in the nomenclature which I used for convenience, without imagining it to be any meritorious creation, the source of some part of the new word-coinage so ostentatiously paraded in the *Notes*, as well as what is a rather more serious 'abstraction,' the origin of his wonderful new suggestion for printing on porcelain and pottery, in black and in colours, from photographically prepared stones, which he has announced as his own, in the *Notes*, two or three numbers back, and repeated later, with additional suggestions for its applicability to the stones prepared by M. Poitvin's process, about the ESPECIAL *applicability* of which to my plan, I had written to Mr. Sutton immediately on the publication of M. Poitvin's process."

"Yours, &c. "C. B."

To the Editor of the Liverpool and Manchester Photographic Journal.

SIR,—Mr. Smith, of Tain, in the letter you inserted, speaks of my letter to him being very different to the one I sent to you. Now the latter you and your readers have seen; and respecting the other (as intimated a very civil one), I wish to say that it was written with the impression that the explanation received from him was true; and also to keep friends as long as circumstances would justify.

As respects his "communicating a process" to me, I am not aware that he has done so, unless (using the illustration of the great Columbus which he has introduced), we admit that it would be honest in him (after being shewn *how* to make an egg stand on end on a table of card-board), as a person of wit to try the experiment on a *leather* table with like success; and then instead of saying, as the friends of Columbus did, "it is easy to do that," assert, I am the Columbus in this case, since I have made an egg stand on leather!

Sir, as you have my process, it is probable that Mr. Smith would furnish you with his also, if he has any thing deserving the name of a process, and then you for one can form an opinion as to who is right when statements disagree. Yours truly,

THOS. BULLOCK.

Brunswick-st., Macclesfield, Dec. 9th, 1857.

[Our correspondent has sent us an excellent specimen taken upon an enamelled address card. It is the first specimen of this class which has arrived by post perfectly uninjured.—ED. L. & M. P. J.]

To the Editor of the Liverpool and Manchester Photographic Journal.

Sir,—However much I may regret the want of a gentlemanly tone in Mr. Burnett's charge, I cannot but admire his noble efforts in stirring up photographers to immortalize themselves in parian, glass, china, and other fabrics.

"Blessed be the art that can immortalize, the art that baffles time's tyrannic claim to quench it."

The fortune which he has so generously given up to the public, by refusing to take out a patent, is a gift that is praiseworthy in the extreme; there is one little matter, however, that is wanting to complete this noble act of self-denial, viz.: out of all the "highly suggestive" matter, not one formula is given (except the cuprotype, which more of anon), and not one of the suggested plans is found to be practical. The silver, which he seems to spurn, was the very article the specimens of which were so much admired by the members of the Liverpool Society. My paper was a record of absolute experiments, and if in my zeal I have overlooked his pamphlet, (the title of which he has written me is a misnomer, the work itself is merely an æsthetic dissertation), I have only to state I regret the omission, but entirely deny that my experiments were originated from any previous knowledge of his theoretical ideas. On reference to my paper I find I have made a mistake in detailing my last experiment: a solution of chromate of iron was poured upon the coating of milk (copper being found not to succeed), and developed with ferrocyanide. The cuprotype is more allied to Mr. Hunt's chromatype than the process I give. But Mr. Burnett overlooks this great fact, that in all my experiments I laid over them a solution of flux, and thus hermetically sealed the photograph between two layers of glass, which he had never suggested, and it is for this that I claim originality of idea.

Mr. Burnett, in his papers, (*vide Journal* for August,) says, "Various circumstances had prevented him from producing any burnt-in photographs on porcelain or glass." Now can anything be more absurd to a practical mind than this statement, he might just as well have told us he was going to act the play of Hamlet without the character of Hamlet.

This "secret of such value," which he says I am not likely to give to the public free, is a gratuitous assumption, for he ought to know that other people besides himself can act generously to the public, and that neither self-denial nor nobility of conduct are entirely confined to him. Any one rambling over the entire field of experiment is sure to stumble upon something or other, that others following in the same track may fall upon, but the only value of this pursuit depends upon the successful termination at which they arrive. Increasing demands upon my time prevent my carrying this controversy any further.—I am, Sir, yours very truly,

JAS. ALEX. FORREST.

Liverpool, Dec. 7th, 1857.

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LIVERPOOL AND MANCHESTER PHOTOGRAPHIC JOURNAL,
Published on the 1st and 15th of each Month.

THE commencement of the New Year, and of Volume V., presents a desirable opportunity for New Subscribers to forward their names and subscriptions to this Journal. Agencies for the sale of the LIVERPOOL AND MANCHESTER PHOTOGRAPHIC JOURNAL are established in nearly every leading Town throughout England, Scotland, and Ireland, and Subscribers' Names will be received by such Agents. Where a difficulty in procuring the Journal in any locality exists, an order, accompanied by a remittance or reference, may be forwarded to any of the undermentioned Agents, or direct to the Publisher, which will receive immediate attention.

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